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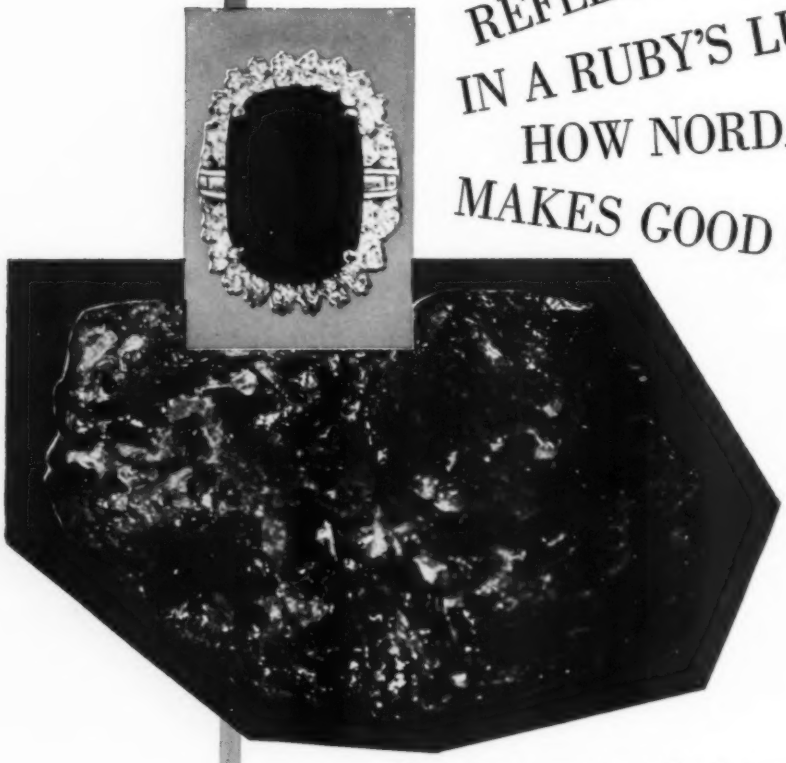

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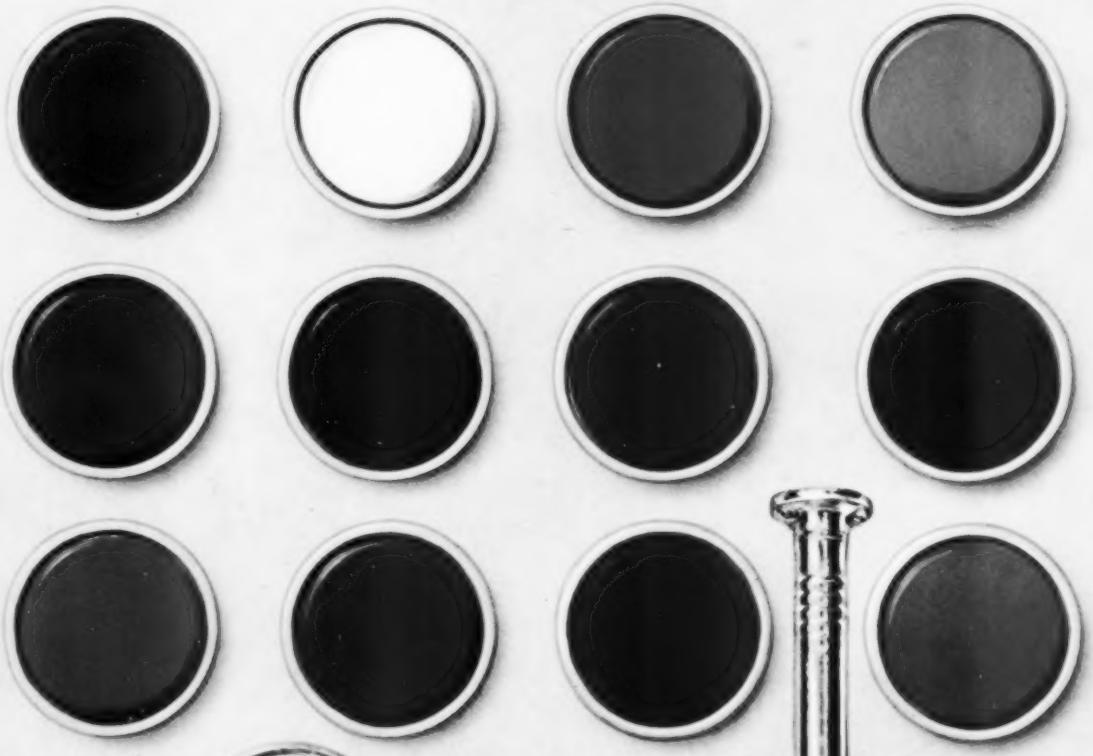

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American Perfumer AND AROMATICS

VOL. 75, NO. 6 JUNE, 1960

Contents

DEPARTMENTS

Publishing Office
418 North Austin Blvd.
Oak Park, Illinois
VIllage 8-6310

Eastern Office
358 Fifth Avenue
New York 1, New York
LOngacre 3-4382

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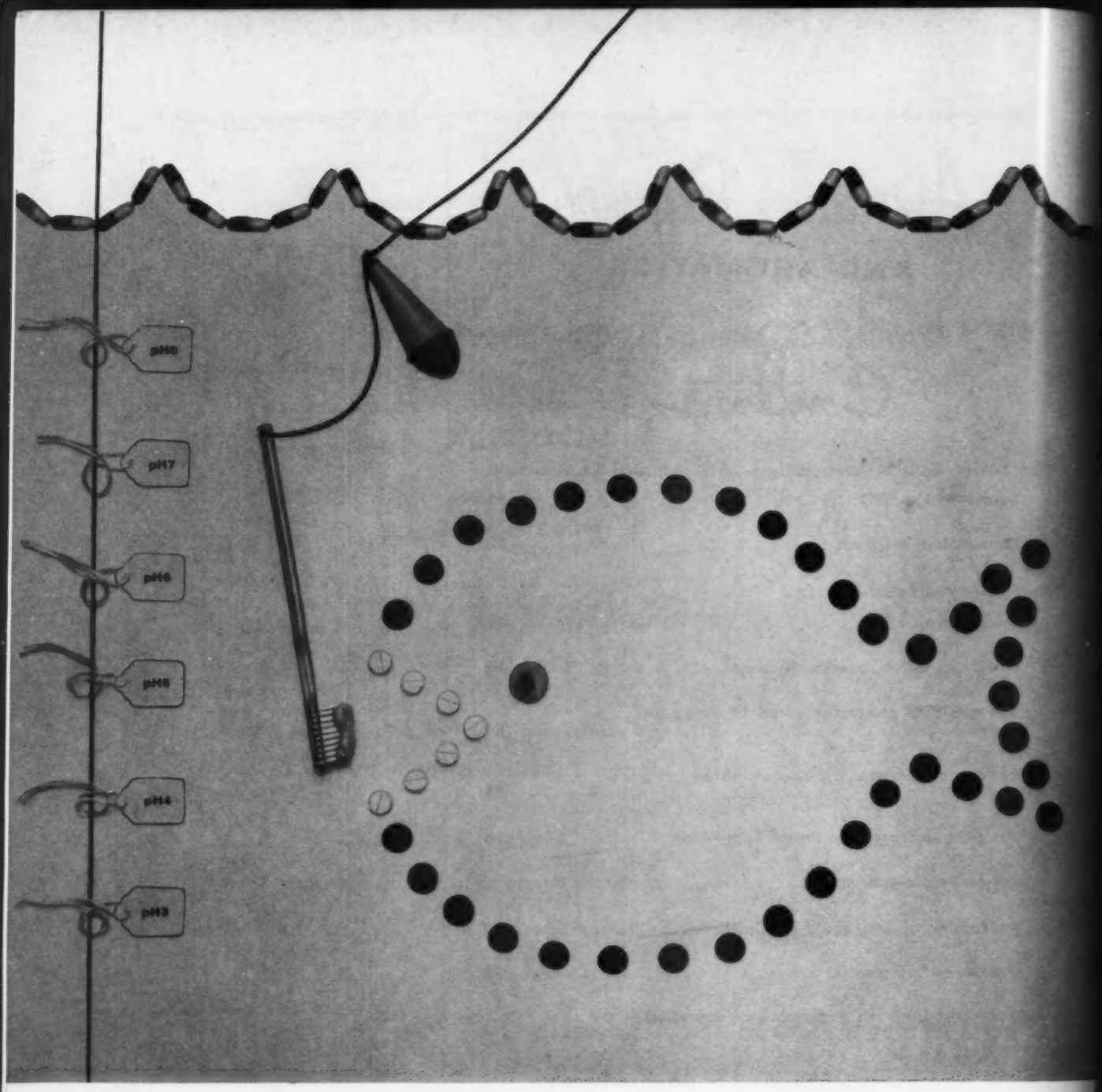
Janet Northrop
Advertising Production Mgr.

Published Monthly by Allured Publishing Corporation. Publication office: 1309 North Main Street, Pontiac, Illinois, U.S.A. Editorial and executive offices: 418 North Austin Boulevard, Oak Park, Illinois. P. W. Allured, President. Subscription Rates U.S.A., Possessions and Canada, $5 one year; $1.00 per copy. Other countries $15 one year. Application as second class matter pending at the Post Office at Pontiac, Illinois under act of March 3, 1879. Copyright 1960 Allured Publishing Corporation, also publisher of The Manufacturing Confectioner, The Candy Buyers' Directory and Dulcedustria.



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Germicides In Household Specialties

A recent leaflet describing the application of disodium 2,2′-thiobis (4,6-dichlorophenoxide) in such products as floor polish, all-purpose cleaners, white shoe polish, tile cleaner and porcelain cleaners shows amounts of 0.0039 per cent to 0.25 per cent reduce germ counts of three bacteria from 66 to 99 per cent.

Formulations are given to aid in developing these products. All have been aged and tested so you can get off to a good start.

Look! No Cavities

According to Arnold writing in the April ARCHIVES OF INDUSTRIAL HEALTH, that so far there is no conclusive proof that fluoride dentifrices prevent tooth decay.

"The results of clinical trials made so far are as controversial as are those obtained by the use of other dentifrices," he said.

Dr. Arnold's remarks were in a report on the present status of dental research in the study of fluorides.

He made these other points:

". . . The use of fluoride compounds, which are applied by dentists, are of value in preventing decay, particularly in areas where fluoridation of public water supplies is not feasible.

". . . The use of fluoride supplements to the daily diet presents and requires daily supervision. Such supplements are most effective during formation of the teeth."

British Chemist Available

A chemist, well qualified with sound pharmaceutical background is available in England. He prefers to become associated with a British division of a U. S. company. Interested parties may get his name by writing to me in care of the AMERICAN PERFUMER.

Canadian—U. S. Common Market

It is good to see John T. Connor's case for a Canadian—U. S. Common Market. Someone has to do it no matter how unpleasant it may be to some of us to read what he says.

His point is that we are both in the same soup with minor variation in trimmings. If we are not careful we will both lose out to cheaper labor countries. Canada and the U. S. are each other's largest customer. It should always be that way.

It is hoped that the passions of Nationalism don't interfere with good judgment—a commodity so difficult to come by.

Fatty Acid Fungicide

The use of various fatty acids as fungicides in skin infections is pretty well known to all. Indeed, several patents and numerous publications attest to the usefulness of these materials.

A new derivative is the monoethanolamide of undecylenic acid, soluble to the extent of 1 - 2% in 50% hydroalcoholic solutions and useful in all dermal preparations where a fungicide is indicated. The fungicidal concentration varies between .1 to 2% depending on the carrier.

Bacteria and Deionizers

Fiedler, writing in the February issue (1960) of the J. AM. PHARM. ASSO., PRACTICAL PHARMACY EDITION, brings to the fore a problem not always recognized by users of water deionizers. True, the problem discussed is aimed at pharmacies, but its significance goes far beyond them.

Bacterial build-up of deionizing beds, especially the mixed bed type, is a common occurrence unless the deionizer is decontaminated regularly. Fiedler shows the rapid increase in the bacterial count of water for the first several

days. With the samples of tap water being germ free every day of the test, effluent water from the demineralizer was negative the first day; 1130 bacteria were found the second day; 7780 on the third day; 9770 on the fourth day, then they became too numerous to count (more than 10,000 per ml.) While there was a significant variation in the bacterial count, the results, noted above are averages of three months of testing.

Obviously the effluent water was heavily contaminated. If stored, the count would certainly increase.

The precautions possible are twofold. First, the demineralizer must be decontaminated weekly. Second, the water delivered by a deionizing unit must be heated at least to pasteurizing temperature to reduce the bacterial count.

Formaldehyde is a safe decontaminating agent. Chlorine liberating compounds are also available from suppliers of deionizing units. J. AM. PHARM. ASSO., PRACTICAL PHARMACY EDITION carries a number of interesting articles on the "Battle of the Charts." I've always maintained accountants can prove anything with figures, if not examined too closely. . . .Just as low M. W. polyethylene can be oxidized to an acid value approximating that of beeswax, so Tennessee Eastman has succeeded in oxidizing polypropylene. These waxes are hard with a high melting point. . . .

Notes

Jacobs and Jenkins make a case for correlating iron content of finger nails and intracelluar iron deficiency in the BRIT J. DERMATOL., 72, 145 (1960). . . . .CONSUMER BULLETIN reporting work by Orban, a specialist on gum diseases tells us to use toothpicks after meals. . . . .There was an era of popularity for "essential unsaturates." Now it is "dehydrogenated" linseed oil with higher iodine value, as an improved substance for cosmetic skin creams. . . . . A new solubility chart is available on dialdehyde starch from Miles Chemical Company. . . . . Usnic acid, a substance I examined some years ago as a fungicide, is being used bv iontophoresis in the treatment of acne vulgaris [AESTHET MED. 9, 2 (1960)]. . . . . Pfizers' suggestion to keep drug and medical disputes out of politics is commendable. One could add to this such things as food additives, lipstick colors, etc. . . . . An article on color nuances in melanins by Schopping and Van Sluis [PEOR p. 181 (1960)] makes interesting reading, particularly since hair coloring is the thought behind the article. Up to now, no one has been able to make a workable hair coloring using melanin, tyrosine and tyrosinase and related substances, although a number of patents cover the ideas. . . . . Dr. G. Carriere of Unilever N. V., Rotterdam, recently sent me a glossary of terms used in surfactant work which appeared originally in a German trade journal. The terms are given in four languages. . . . . Saw a formula for an interesting talc lotion (25% talc) during the TGA and SCC meetings. If interested let me hear from you. . . . . There are a number of references on the oxidation of wood alcohols in the literature, but I saw a four-year old sample on my stock shelf recently that was as hard as glass and as brittle. Watch yours. . . . . In conjunction with the elimination of trade barriers between Canada and the U.S., did you ever stop to think that the duty and brokerage up the cost of goods and the duty collected is more than half lost as income because it is deducted as a business expense. So the governments don't get as much as they think they do. . . . .

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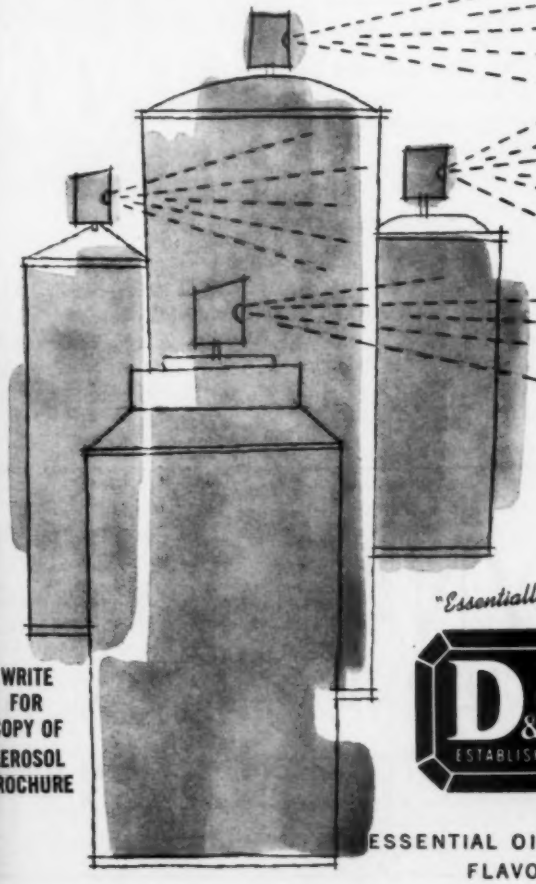

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Questions and Answers

Q. *We have had numerous samples of eye shadow submitted to us for duplication and have noted that whereas the shades of blue, green, brown and black contain inorganic pigments, such as ultramarine blue, chromic oxide, sienna and umber and carbon black, an orchid shade is also offered which obviously contains a coal tar lake. It has been our understanding ever since the Food and Drug Act was amended to include cosmetics that the use of any coal tar color was prohibited in the eye area. We also note that powdered aluminum is being used in these eye shadows. Does this use have the sanction of the FDA? If so, can you give us the name of a supplier of such material of the requisite degree of purity? L. O. H., Iowa*

A. To our knowledge, only inorganic colors can be used in the eye area. Therefore, the eye shadow which you think contains some red coloring would, of course, be violating the Food and Drug Act. However, before making such a claim, you have to be quite certain that this is so. Ultramarine violets vary widely in their tinctorial power and in their shades. Furthermore, it would be possible to use carmine in such a product if so desired, as it is considered a natural coloring. The aluminum powder used in eye shadows can be obtained from the Aluminum Company of America, Pittsburgh, Pennsylvania. The fineness of powder required varies with the iridescence desired, and you may have to try several to get the effect you want.

Q. *We have seen particulars in your magazine for aerosol packaging and would like to put up a plant in our country. We would like you to put us in touch with the manufacturer in your country so that we can start this industry. Also advise if we have to import aerosol cans or whether same can be manufactured here. Your full details on the line will be greatly appreciated. J. W. H., India*

A. We think that perhaps you shall have to be the one to determine whether cans can be made in India or whether they should be imported. Our off hand opinion would be that you would have to import cans made in some country like the United States, Great Britain or one of the countries on the Continent. We are not quite certain what you have in mind in the way of getting in touch with manufacturers, but if it is private label manufacturers with whom you would like to make an association, we are giving you the following names to contact.

Aerosol Techniques, Inc.
111 Silliman Avenue
Bridgeport 5, Connecticut

Connecticut Chemical Research Corp.
706 Bostwick Avenue
Bridgeport 5, Connecticut

Gene Rose Company, Inc.
1637 South Kilbourn Avenue
Chicago 23, Illinois

G. Barr & Company
3601 South Racine Avenue
Chicago 9, Illinois

We further suggest that you get a copy of the book by Herzka and Pickthall entitled PRESSURIZED PACKAGING (AEROSOLS) which can be obtained through the AMERICAN PERFUMER BOOK DEPARTMENT or directly from the publishers, Butterworths Scientific Publications, London W. C. 2, England.

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- Myrj® 45, 51, 52, 53, 59, G 2162 Polyoxyalkylene Fatty Acid Esters
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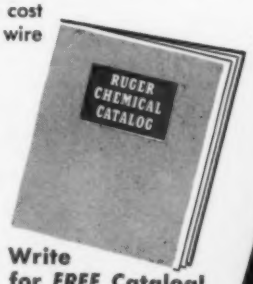

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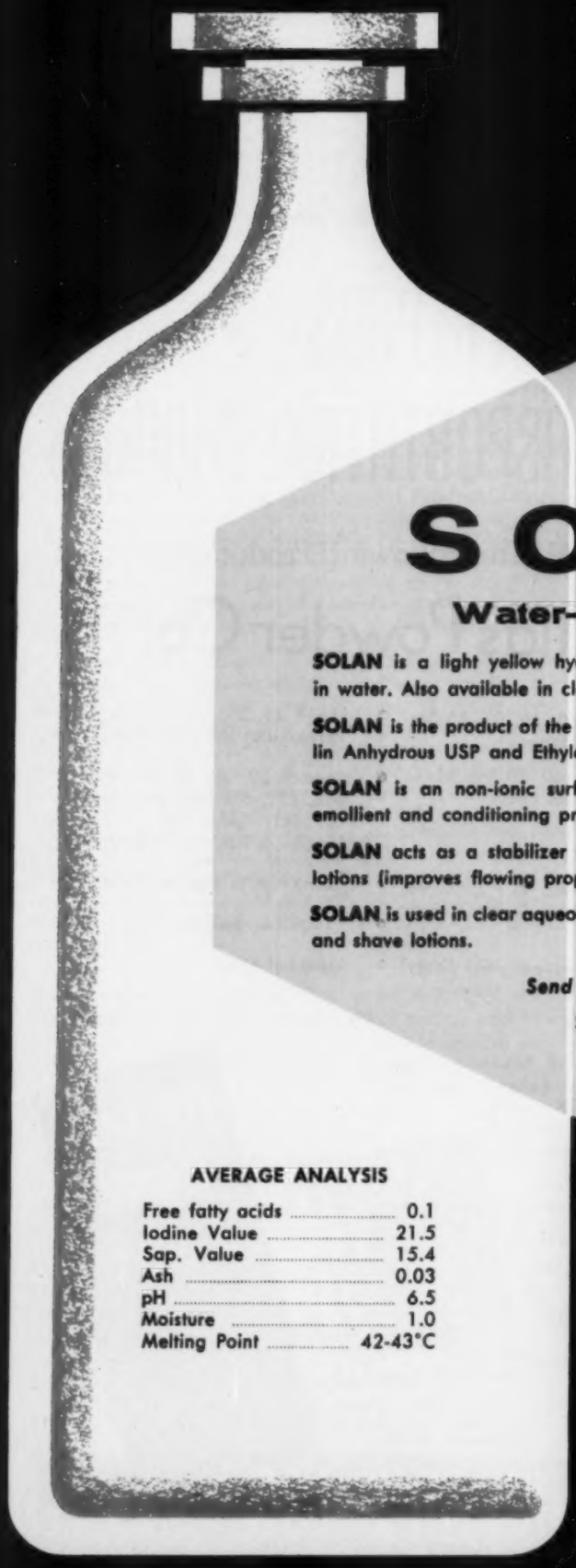

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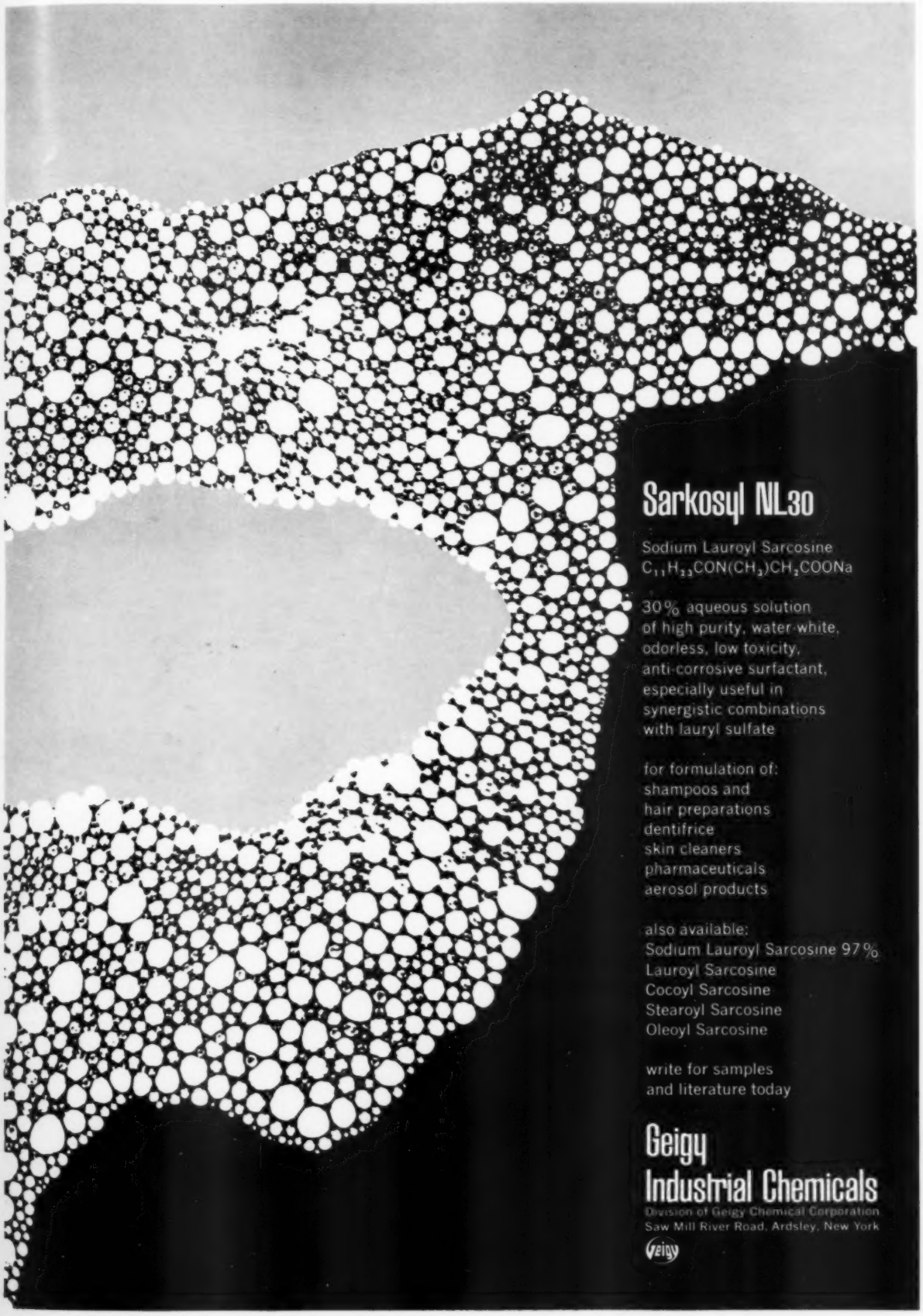
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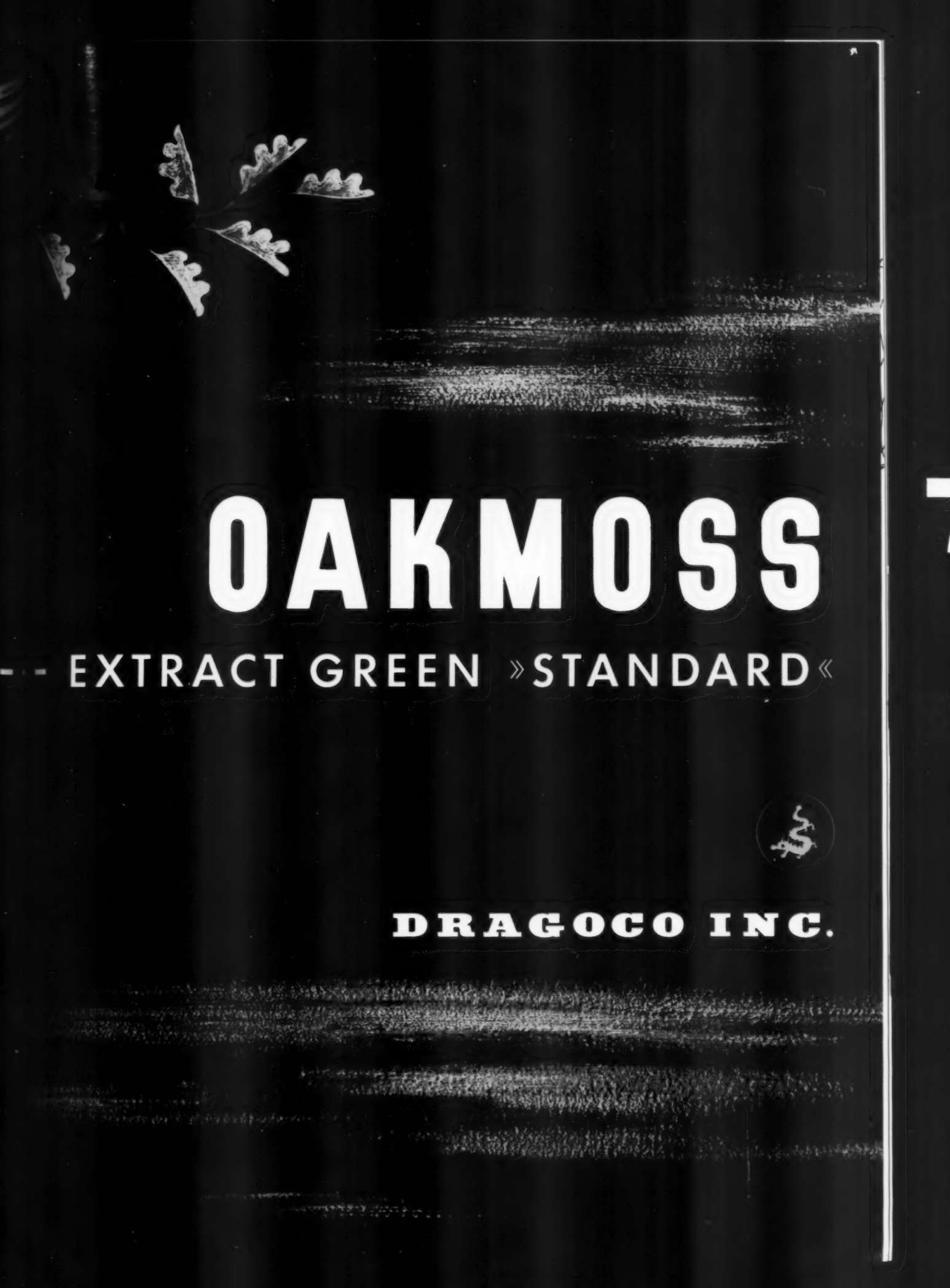
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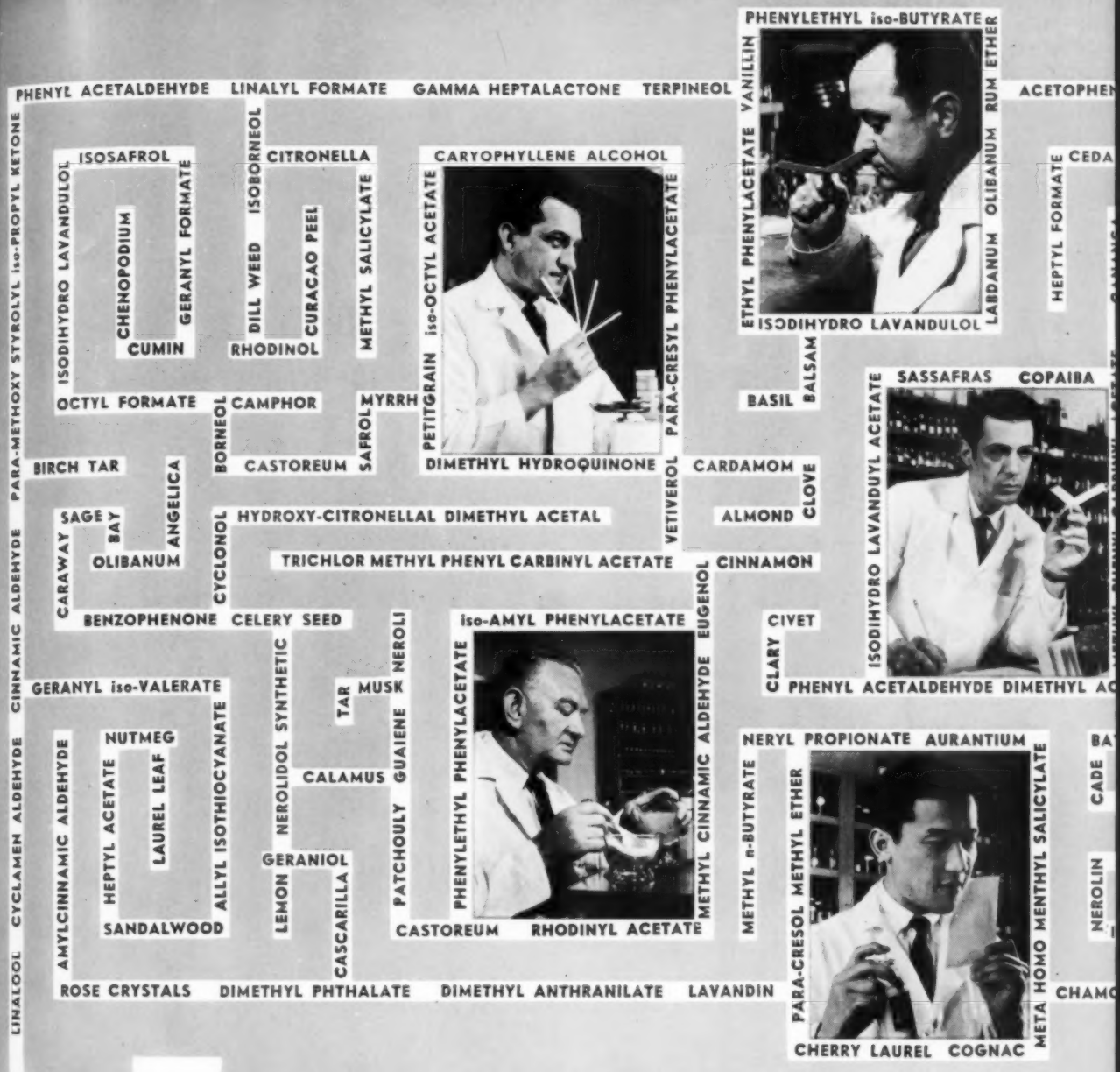

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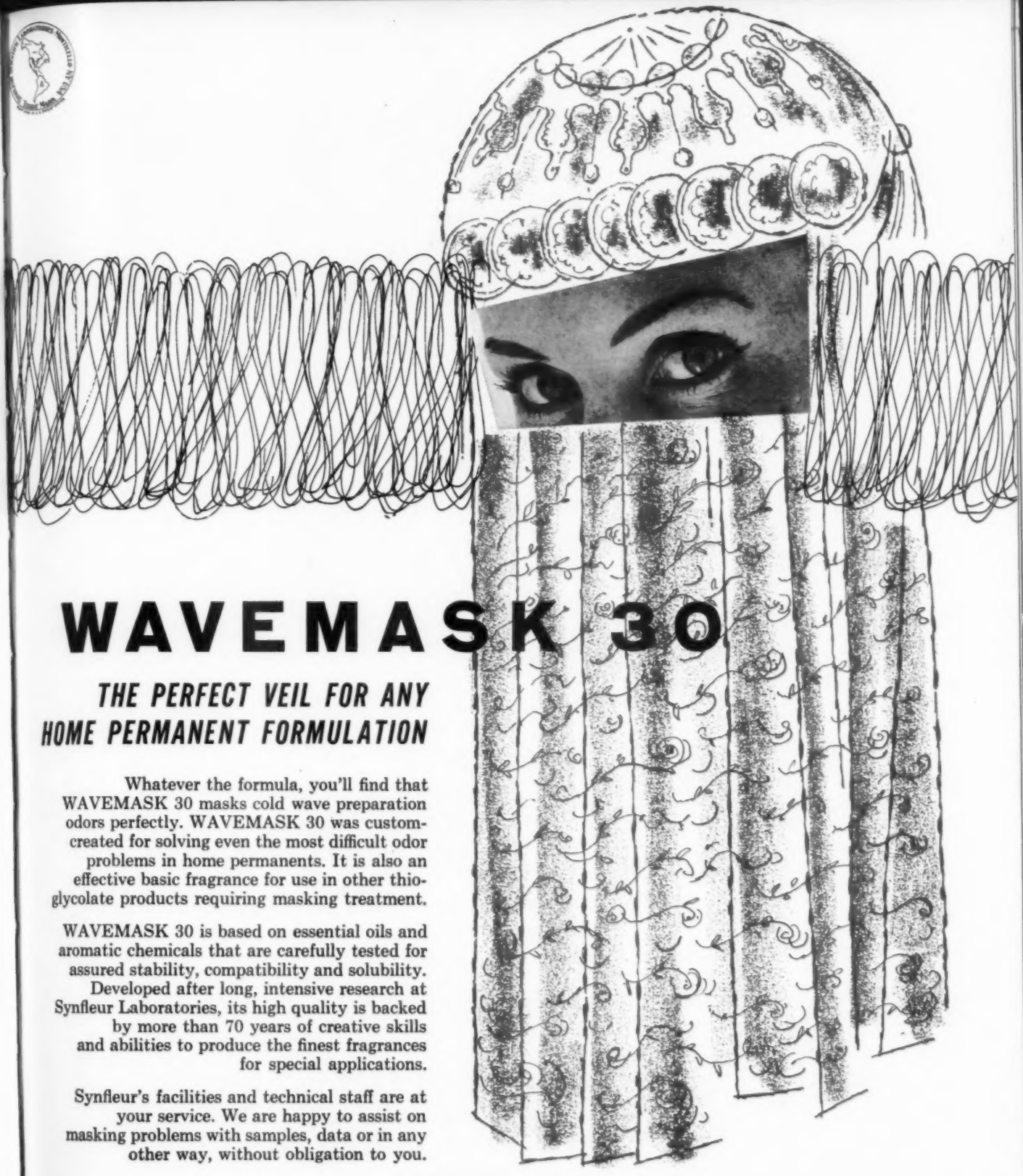

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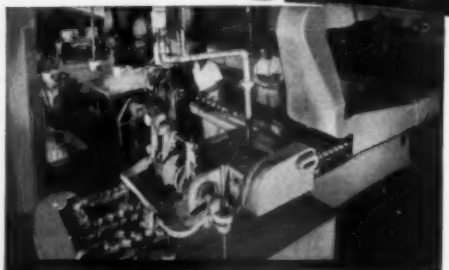

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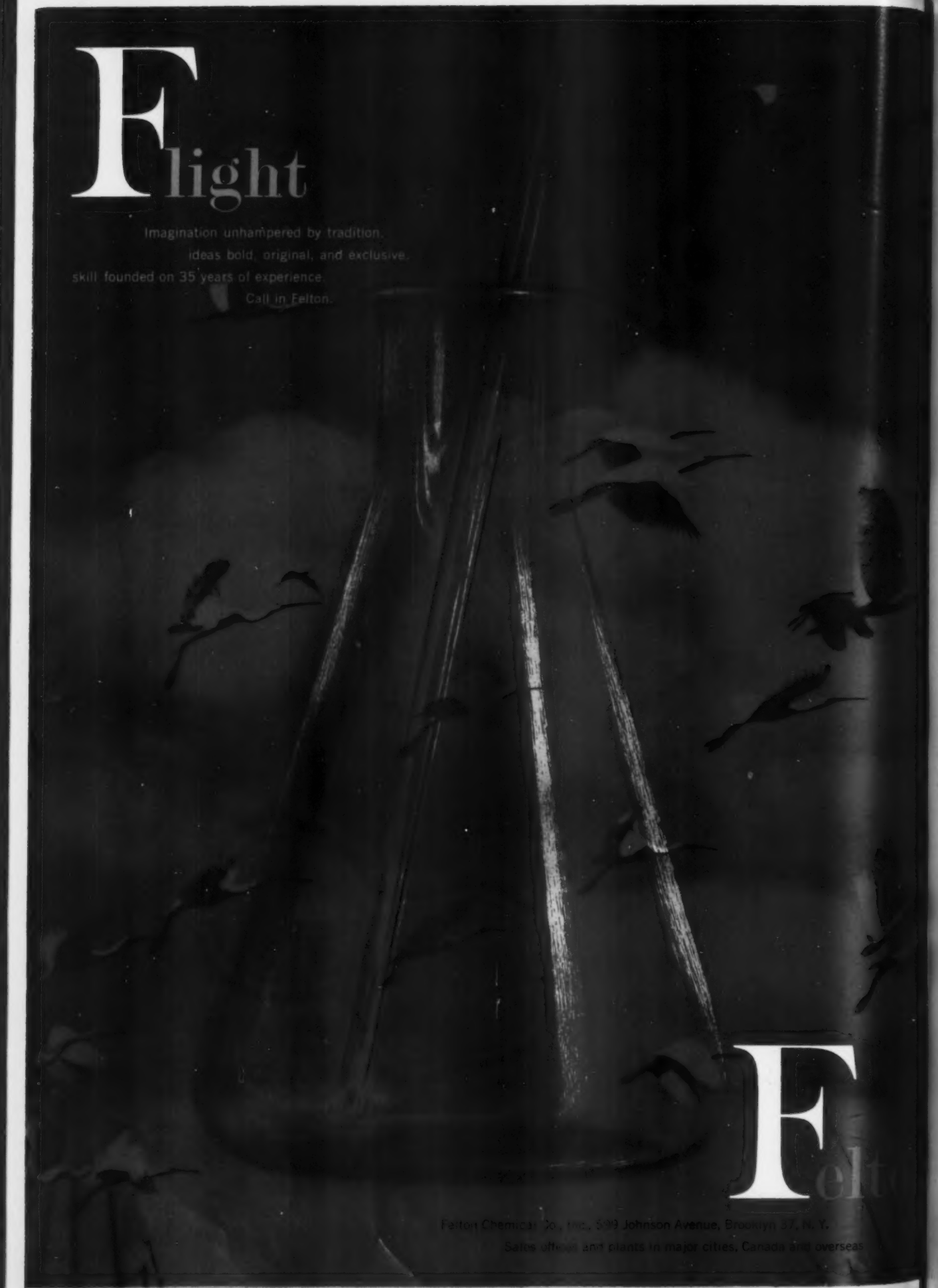
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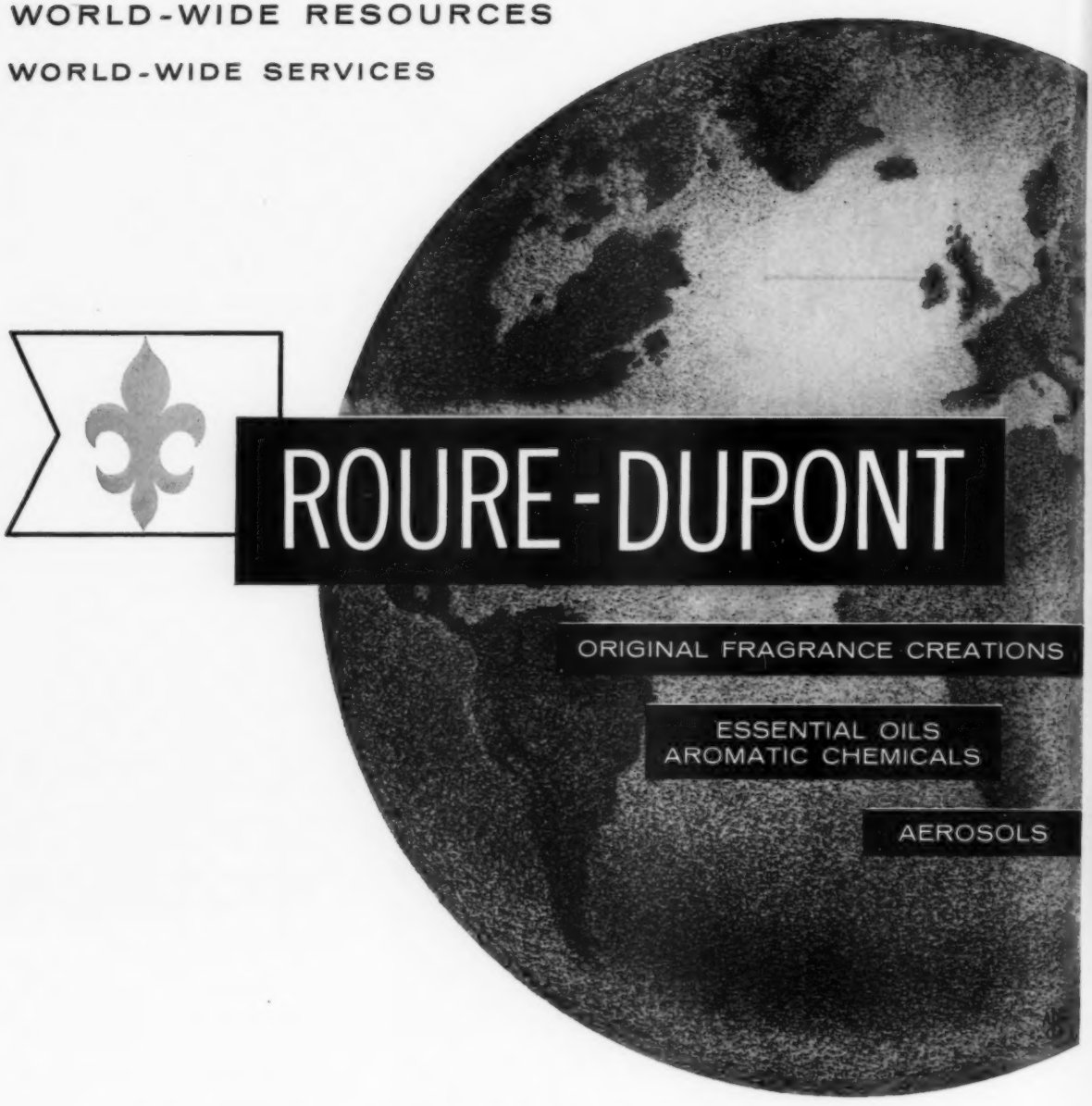

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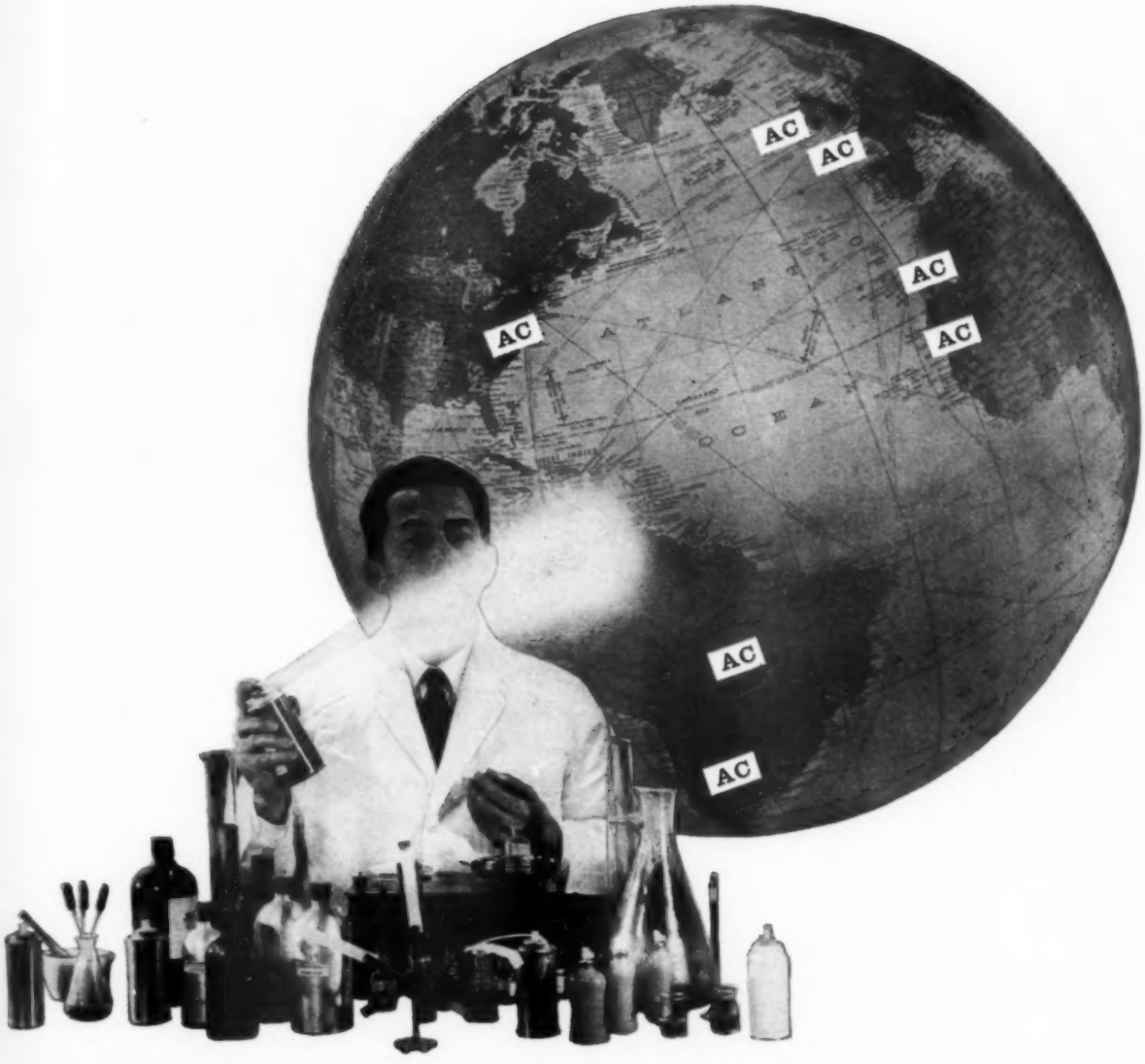
*Michel Prunieras, LA THERAPEUTIQUE TISSULAIRE EN DERMATOLOGIE, No. 205, July 1949



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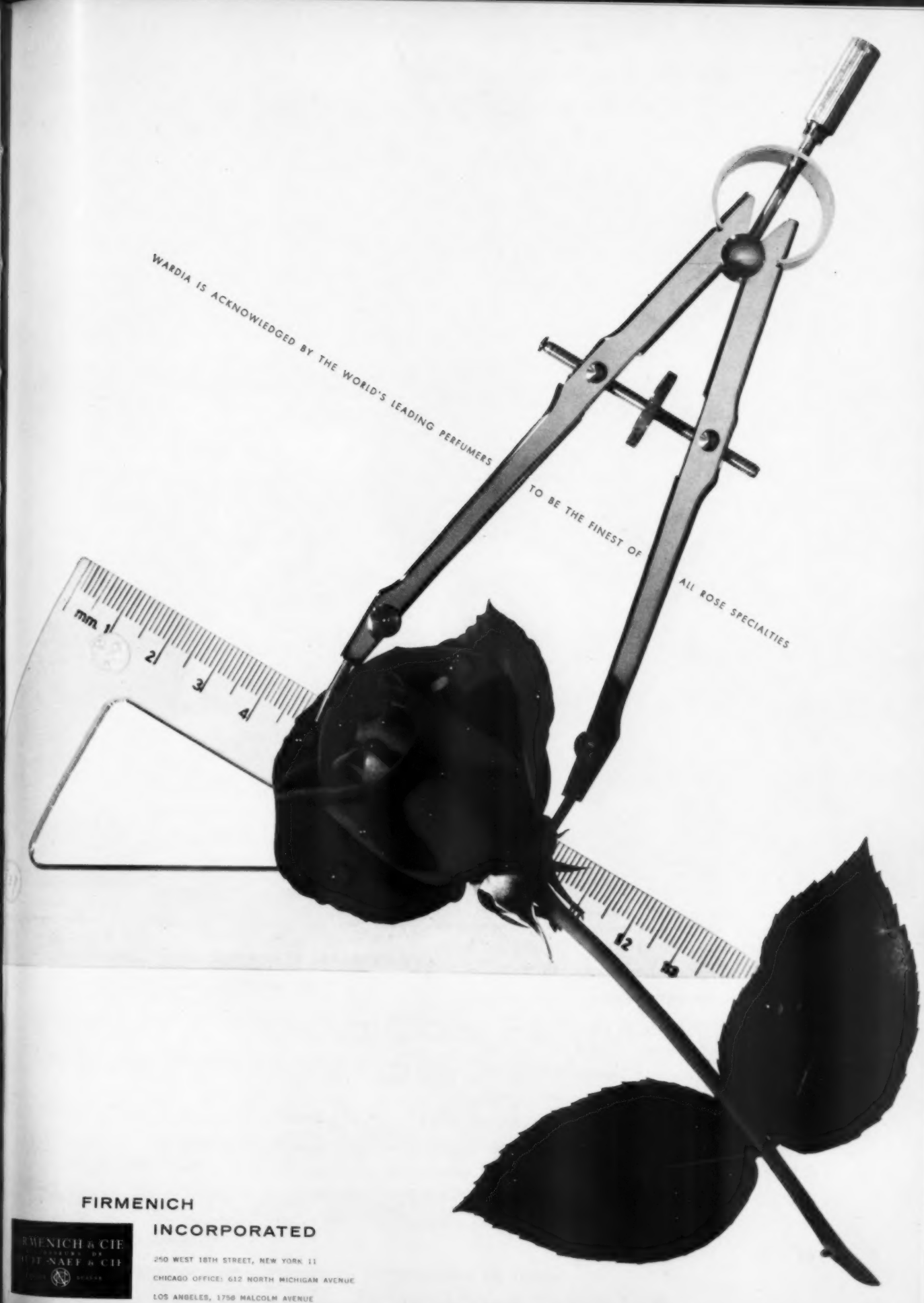

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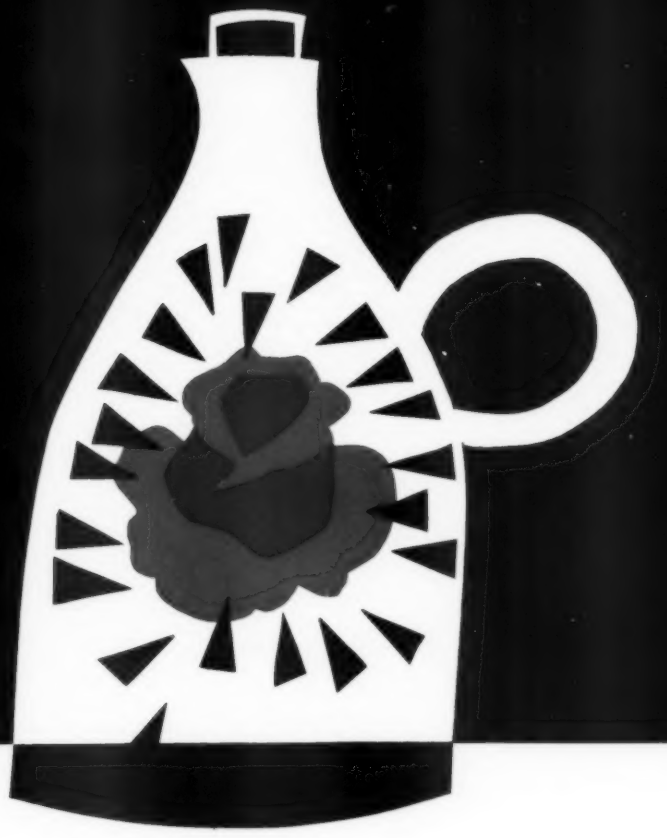

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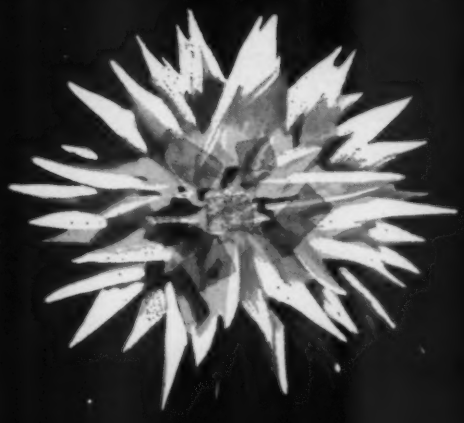

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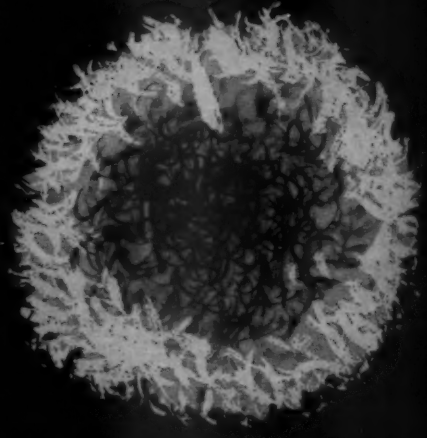

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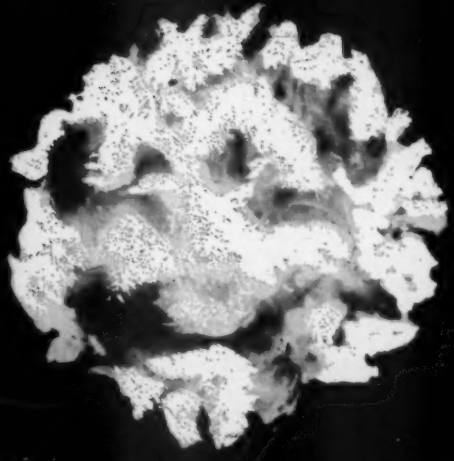

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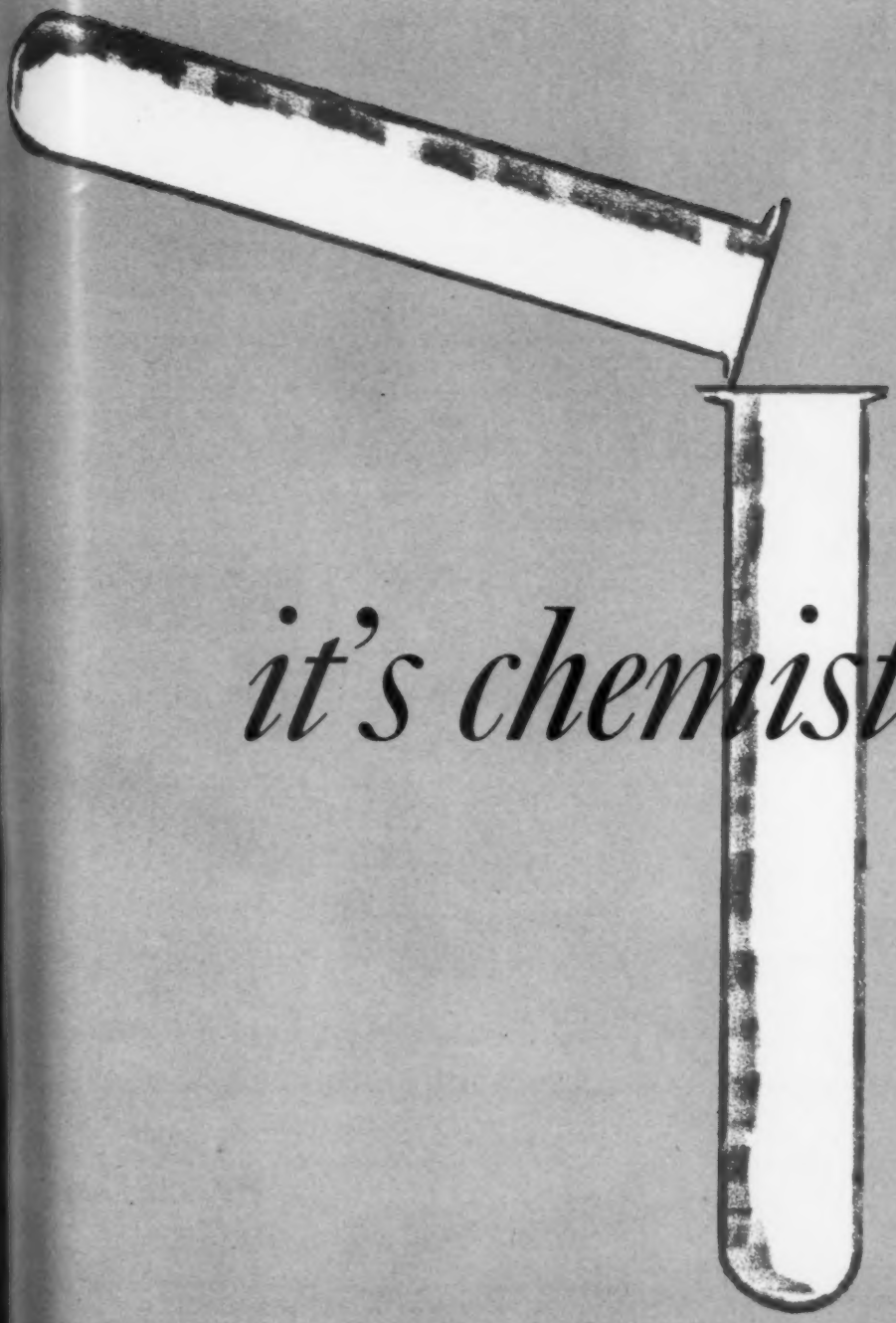

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American Perfumer

June, 1960 Volume 75, Number 6

A salute to the Toilet Goods Association

BY STANLEY E. ALLURED
Assistant Publisher

More than sixty years ago, a group of manufacturers of cosmetics and toilet goods banded together to form the predecessor of the present Toilet Goods Association. Since that time its services to the industry, and its stature within the industry, gradually grew until it has truly become the recognized "spokesman" for the industry in all its contacts with outside interests and the government.

There are always two distinct types of activities of trade association officials; one the official duties and activities as outlined in their brochures and other official publications, the type that sells memberships. The other type of activity centers around unofficial consultations and conversations, with both members and others, that has the net result in that "ephemeral" quality called leadership.

It is on the side of leadership that the TGA stands above most trade associations. It comes from more than just close contact with the leaders of the field; it is intimate day-to-day handling of the industry problems, that leads to the knowledge and experience that becomes leadership. The one other prime requisite for effective leadership is confidence in the association staff by industry, and this the TGA seems to have in abundance.

The basis, however, of all association activities must be specific, spelled-out, services which it is set up to accomplish, and organized to do more efficiently and quickly than any other source. The following list gives a quick analysis of these services.

The inclination is to call them, "member-services". However, one of the unique facts about the TGA is that it considers itself the spokesman for the industry, and questions to the staff are answered without regard as to the membership status of the questioner. More often than not, in fact, the questions do not come from within the industry at all, but from others asking *about* the industry. It is in this respect that the TGA renders a very valuable, though usually unrecognized service. It is seldom recognized that the impression gathered about an industry are often those gained from contact with the trade association of that industry. When that association knows the answers, and can give them quickly, accurately, and without regard to the questioners connection, the industry as a whole gains in stature.

Legislative activities

Legislative activities of associations generally account for the largest amount of staff time, and receive the least publicity, of any other. This is partly because the type of work is best done without a lot of fanfare, but primarily because accomplishments are mostly negative. That is, the efforts are almost always defensive against a "bad bill" rather than positive, for some bill that is considered necessary. The result is that "accomplishments" are in the negative terms of "no bills". The TGA has been singularly successful in this regard. It has been so close to 100% successful, that the one or two failures have served only to underline its remarkably good record.

The present activity of the TGA in regard to the pending legislation on the certified colors is a good illustration of the intricate, frustrating and yet absolutely necessary fact-finding and negotiation that are indispensable parts of this type of work.

Advertising board of standards

Inaugurated in 1938, the TGA board of standards has the duty of reviewing advertising copy voluntarily submitted by industry members, to determine its

suitability in connection with present FDA and FTC regulations. Television commercials are also checked when showings are arranged in New York City. This service is, obviously, highly confidential, and is handled only by the executive vice-president, the scientific director and the legal counsel. In not one instance has a piece of copy which has had TGA board of standards approval, ever been questioned by FDA or FTC.

Under the perfectly obvious fact that regulatory bodies do not differentiate between members and non-members of TGA, any advertising copy concerned with this industry is reviewed by this board. Since objectionable advertising by non-members can be just as harmful as that done by members, this service is open to all, and thereby benefits the whole industry.

Scientific cooperation

A Scientific Advisory committee, the personnel of which are recruited from the technical staffs of member companies, is the basis of the TGA effort in this direction. This committee's early work was largely responsible for the fact that the Federal Food, Drug and Cosmetic Act is both adequate and reasonable. The committee was of inestimable value during the war in the development of substitutes for scarce materials, and it is largely due to its efforts that the industry was permitted to live and prosper during a period when many of its classic raw materials were not available.

The major activity of this group, at present, is the development of improved standards for cosmetic raw materials. It has succeeded in producing seventy nine such standards, most of which call for a higher degree of purity than is required by the U. S. Pharmacopoeia.

The Association formed its Scientific Section in 1943 and its membership consists of upwards of 500 scientists engaged by member companies in research, control and production. The Section holds two meetings a year at which reports, papers and addresses are presented. These are published immediately after each meeting in a technical magazine, "The Proceedings of the Scientific Section of the Toilet Goods Association," which is available to non-members as well as members.

The scientific director of the TGA, Mr. H. D. Goulden, chairmans the Scientific Advisory committee, is editor of the Proceedings and permanent secretary of the Scientific Section. In addition, he is available for consultation by all members on problems concerned with scientific matters.

Trade mark services

The TGA maintains a Trade Mark Service, unsurpassed by that of any other business organization. This was one of the first activities of the Association and is considered one of its outstanding activities.

The Service consists of several features of which the most important is the "Trade Mark Record" and its supplements. It is a book of more than 750 pages which lists all registered trade marks in the field of perfume, toilet preparations and soaps as well as thousands of additional marks in use but not registered in the United States Patent Office. Supplements are published at frequent intervals.

The Association also maintains a card file of additional registrations and unregistered marks so that its listings are kept constantly up to date. A telephone call to Association Headquarters accordingly furnishes any industry member a quick and accurate means of establishing whether any name he contemplates using is in conflict with a mark already in use.

A further service lists, in bi-weekly bulletins, marks which have been filed for registration with the Patent Office, as well as cancellations and reregistrations.

The importance of this Trade Mark Service cannot be overemphasized. The value of knowing, positively, that a certain mark is available or already claimed, and on a moments notice, is almost beyond calculation.

As incidental benefits these lists are frequently consulted by stores and buying offices in search of goods, by motion picture, radio and television writers to avoid fictitious use of names already being used, by advertising agencies, news writers, buying offices and many others in efforts to advise the public about trade marked merchandise.

Labor relations work

For several years, the TGA has had on its staff one of the best labor relations experts in the country. His counsel and advice to the Association and to individual members, excepting in cases where he is called upon to perform individual services of a time-consuming nature, is paid for from Association funds and comes to each member as one of his regular privileges of membership.

The Association makes an annual detailed survey of wages, working conditions and employee benefits existing in the industry. This survey, in the hands of active members in mid-summer has been widely accepted by employee groups and by Government authority as an accurate summary of labor conditions in the industry. The job classifications worked out for this survey have been accepted as the standard for the toilet goods industry.

Industry service

From the above listing of specific TGA activities, it is quite clear that the TGA is oriented much closer to "industry" service, than to the more narrow concept of "member" service. It takes seriously its task of presenting to the world a favorable picture of the industry which it serves, which is, in many respects, an association's most important responsibility.

TGA staff

The present executive staff was set in its present pattern during 1942. In that year, S. L. Mayham was appointed executive vice president, after serving for a few years as scientific director. Mr. H. D. Goulden, the present scientific director was appointed that year, and Miss Kathryn Fitzpatrick, executive secretary of the association, also joined the staff in 1942. Since that time, these three, with the rest of the staff, have worked as a remarkably harmonious team, and the present high status of the Toilet Goods Association is ample evidence of their effectiveness.

THE END

Program of the

Toilet Goods Association, Inc.

June 26-30, 1960 Poland Spring, Maine

Sunday June 26

3-5 P.M. —June 26-30, 1960 Pick up badges at TGA Headquarters, Victorian Room, main lobby.

6:30 P.M.—Dinner in Main Dining Room.

Monday June 27

9:00 A.M.—Registration—TGA Headquarters—Victorian Room.

10:00 A.M.—Business Meeting—Ballroom.
Call to Order—Arthur E. Johnston, President.
President's Address.

Film—"The Market of the 60's"—by Life Magazine, William L. Fort, Manager, Drug & Toiletries Sales Promotion.

The film sets the theme of the Convention which is: "Toiletries—Today and Tomorrow".

Address—"The Washington Scene"—Wallace Werble, Publisher "F.D.C. Reports".

Election of Officers and New Directors—S. L. Mayham, Presiding.

12:00 P.M.—"Picnic in the Pines"—A feature of the Poland Spring House; outdoor luncheon with all the lobster, etc. you can eat, held in the pine grove on the grounds.

2:30 P.M.—Business Meeting.

6:00 P.M.—Cocktail Party, given by Fragrance Suppliers in Grand Ballroom and Patio. Dinner in Main Dining Room.

9:00 P.M.—Grand Ballroom—Vaudeville Show and Dancing.

Tuesday June 28

Toilet Goods' Industry Golf Tournament—all day.

9:00 P.M.—Presentation of prizes and trophies.
Singing by Orpheon Choral Group. Dancing.

Wednesday June 29

10:00 A.M.—"Consumer Buying Trends in Toiletries", by James O. Peckham, Executive Vice-President, The A. C. Nielsen Company, Chicago, Illinois.

Panel: "Toiletry Merchandising Trends"—Moderator: C. R. "Bud" Keeley, Vice-President, "Beauty Fashion" Magazine.

Panelists: Representing Variety Store Field—Preston J. Beil, Editor and Publisher, "Variety Store Merchandiser" Magazine.

Representing Chain Drug Store Field—Harry J. Towers, Executive Vice-President, Associated Chain Drug Stores.

Representing Department Store Field—James J. Moyer, Cosmetic Buyer, Lord & Taylor.

Representing Supermarket Field—J. B. Brewer, Executive Director, Toiletry Merchandisers Association, Inc.

Representing Wholesale-Retail Field—Henry H. Henley, Executive Vice-President, McKesson & Robbins, Inc. and Chairman of the Board of N. W. D. A.

Representing, House-to-House Field—Russell Rooks, Executive Vice-President, Avon Products, Inc.

12:30 P.M.—Luncheon.

6:00 P.M.—President's Reception—Host will be TGA.
Dinner in Main Dining Room, Dancing, Grand Ballroom.

Perfumery Documentary

. . . . . *an introduction*

Dr. Victor G. Fourman
Syntomatic Corporation

This Documentary is designed to aid perfumers and those who use perfume materials in the manufacture of finished products. The contributions come from a number of countries, which give an international character to the compilation, a character the world of perfumes so richly deserves since its leading authorities as well as its raw materials are drawn from many parts of the globe. The emphasis is placed on the practical side of the subject yet, to unify the field, neither the history of perfume nor other general observations are neglected.

A discussion of the physiology of the sense of smell is not included as it has been adequately treated elsewhere. For the same reason one should not expect to find here a comprehensive account of the chemistry of aromatics. The chief aim of the Documentary is to present guideposts in the use of perfumes for a large number of diversified products, such as fragrances, cosmetics, soaps, plastics, space odorants and dermatological preparations. Skin irritation, stability and solubility and other important factors are examined by competent specialists who have years of experience in their respective fields.

There is now an almost endless number of essential oils, aromatics, animal fixatives and balsams at the disposal of the perfumer. So, too, there is an almost endless number of perfume compounds from which the chemist can make his choice in selecting the most effective fragrance for a given product. If the Documentary can help to simplify such baffling problems, and I believe that it can, it has accomplished its purpose.

Remarkable advances in the application of gas chromatography and infra-red analysis to the study of essential oils and aromatics have enabled the chemist to extend his investigations into areas never reached before. Such techniques, together with the methods of classical organic analysis which are still the best in certain cases, yield results of great value in understanding the nature of perfume materials. These results in turn now make available to the perfumer materials with which he can create fragrances of such excellence, odor value and stability, that they are beyond the dreams of his fellow workers of a decade ago. Instrumentation methods, however, are not described in this Documentary because they, too, are discussed in many scientific publications. While everyone who uses perfume materials is benefited by the work of investigators using these modern tools of science, it is the application of the results with which these papers are mostly concerned. The dramatic success of physicochemical methods deserves our admiration but these approaches in perfume research are a means to an end. The ultimate achievement is still the artistry of the perfumer.

Other technological developments in perfume chemistry must not be overlooked. The newer synthetic materials, the use of rarer essential oils, the pharmacological properties of essential oils, to name a few, are documented in this report. The series has been planned so that it can be of lasting value for a long time to come but a final dictum on even a small segment of a perfume problem is hardly possible since new ideas, new approaches and new methods are always in evidence. Research laboratories of suppliers and important users of perfume materials, the scientific sections of The Essential Oil Association and of The Toilet Goods Association, The American Society of Perfumers, The Society of Cosmetic Chemists, and the work of consultants all contribute to the vast store of knowledge about perfumes.

Unlike treatises and handbooks on perfumery, which have their great value, this Documentary is not concerned directly with perfume formulations as such. The finest perfume formulas in existence will always remain "secrets of the trade". For those seeking a magic formula with which to reap a fortune, there will be little reward in reading these pages. It is not the intention of The Editor nor the contributors to offer an Aladdin's Lamp but rather a lamp for shedding light on the nature and use of perfumes and on the best possible results that can be obtained under given conditions. For these efforts the Editor and the specialists who have written this collection of technical papers are to be congratulated. A difficult task has been carried out in a splendid manner.

Notes on Toilet Soap Perfumery

BY W. PHILLIPS
Van Ameringen-Haebler Div.
International Flavors & Fragrances

Most perfumers are agreed that in the practice of perfumery, the most difficult problems are encountered in the field of soap perfumery. This is mainly due to the fact that perfume in soap is subjected to more rigorous and unfavorable conditions than in most other products.

It is a truism among perfumers 'that you never quite get out of soap, what you put into it'. Invariably soap modifies the odor of a blended perfume. Many perfume compounds that smell very promising in the beaker or from a test paper are a complete disappointment in soap. Good results are difficult to achieve. An outstanding soap perfume can be regarded as a notable accomplishment, and is usually the result of many experiments carried on over an extended period of time.

Soap perfumes need to have considerable strength for good performance. Delicate nuances get lost in soap. Hence it is difficult to reproduce effectively in soap, the expensive fashionable fragrances with their exquisite characters and elegant finish.

The property of lasting strength which is so important in soap perfumes is well exemplified by the natural essential oils. It is this property that makes them so valuable to the soap perfumer. Take for instance, Geranium oil. A rose compound for soap without a small addition of Geranium Oil lacks body, and in effect may be compared, in a different sense, with a dish of food that lacks salt.

However many of the natural essential oils are expensive. The supply is not always adequate to the demand. Shortages develop with attendant speculation. Consequently the proportion of natural oils that may be used in the average toilet soap perfume is strictly limited. This is particularly true in the case of a soap perfume which is required in very large quantities, say several tons per week, not an unusual figure for the big soapers with a huge output. To increase the difficulties of the soap perfumer is the everlasting problem of low cost. The cost of perfume for a 10 cent cake of soap must necessarily be limited to some fraction of a cent per cake.

Considerable experience is required to produce a satisfactory soap perfume, which will avoid as far as possible the special problems of supply and cost. The natural essential oils and their derivatives, such as Geraniol, Citronellol, Ionones and many others are indispensable in the compounding of a fine soap odor. Often in the past, the specter of short supplies of these basic materials has risen to plague the harried soap perfumer. As a consequence the soap perfumer has turned more and more to the use of synthetic aromatics because of predictable supplies, uniformity, price stability and lower costs. He has welcomed the development of new synthetic materials, which today play a large part in modern soap perfumery.

The American Aromatic Industry has performed a remarkable role in meeting these new demands and in setting new fashions in soap perfumery through the use of these new synthetics.

The soap perfumer has many problems in normal times, but in time of war he had to try and achieve the impossible. The quality of the soap perfume had to be reasonably maintained despite shortages of important ingredients. Frequent formula changes had to be made to meet the ever changing situation. Dur-

William Phillips, author of this article, started his career as a retail pharmacist in England. In 1915 he became a pharmaceutical chemist for Lever Brothers Ltd. specializing in cosmetics and perfumes. He was later transferred to the United States where he served the soap manufacturing industry until his retirement twelve years ago. Mr. Phillips maintains a laboratory in his home in Belmont, Massachusetts and works as a consultant to the perfume, cosmetic and allied industries.

ing this period, the soap perfumer was greatly assisted by the Aromatic Chemical Industry. Though beset with immense difficulties, the Aromatic Chemical Industry through their technical achievements and intensive research were able to provide good practical duplications of many indispensable natural perfume oils. In many instances their resourcefulness saved the situation. They earned and deserved the thanks and appreciation of the hard pressed soap perfumer.

Some of these substitute products which were born of war time necessity, have become standard articles and are much used to this day, because of their excellent perfume qualities and economical prices.

Several decades ago, a soap perfume formula consisted mainly of natural essential oils, which in those days cost less than the few synthetic aromatics then available. Formulas were very simple, consisting of only a few items. How different is todays modern soap perfume formula, which perforce uses natural materials sparingly, together with a multitude of synthetics. Successful formulas now in use contain as many as 50 or more single items. Aromatic chemicals, each with a single odor, must be woven into a complex pattern. As an example, take an Artificial Jasmine, the formula for which may fill a whole page in the formula book, and the first item may well be Benzyl Acetate. There are available many elegant synthetic Jasmines as well as other beautiful Florals, which reflect the great skill of the master perfumers in our industry in the use and combination of synthetic materials.

A soap perfumer should have a good knowledge of the Chemistry of Aromatics. He must take into consideration their chemical structure and properties. The possible interactions between different materials when they are brought together. The liability of many materials to undergo oxidation, hydrolysis, polymerization and other undesirable changes, which are more likely to occur in soap than in other perfumed products. He will note that many odorants are prone to be injuriously effected by exposure to the ultra violet rays of sunlight, and to the oxygen of the air. All these contingences must be taken into account to avoid gross errors.

A study of the Chemistry of Aromatics indicates that many of the materials in everyday use for making soap perfumes are on the list of suspects, and many others actually on the prohibited list. Apparently few materials are entirely stable in soap, and trouble can be expected all along the line.

However there are exceptions to every rule. For example Hydroxycitronellal alone in soap rapidly deteriorates exactly as mentioned in the book. But used in combination with certain alcohols, it is quite stable and lends its flowery fragrance to the perfume compound. Amyl Cinnamic Aldehyde, extremely unstable and readily oxidized (unless stabilized), is remarkably trouble free in soap, and is one of our outstanding floral components. When the initial cost of production was reduced, and this synthetic became available in sufficient quantities, its adoption in soap perfumes, long deferred, became a certainty.

The practical soap perfumer does not allow himself to be unduly hampered with troublesome restrictions. He throws the book away and proceeds with his experiments. The use test in the product and the long storage ageing test can be relied upon to tell the story.

The Soap Base

Any notes on soap perfumery would be incomplete unless accompanied by a discussion on the nature and quality of the soap base. This subject is of prime importance to the soap perfumer.

Unfortunately the quality of the soap base is not usually within the control of the perfumer. His best efforts are often defeated by having to work with a soap of inferior quality. It is our experience that even the best and most carefully made commercial milling soaps frequently leave something to be desired. Long experience has proved that perfume cannot completely cancel the deficiencies of an off quality soap. Unless the soap is of good quality, free from excess alkali, has no objectionable by odors, and most important of all, contains an effective antioxidant, successful soap perfumery cannot be achieved.

Free Alkali In Soaps

Soap makers contend that complete saponification of fats is never attained in the kettle, and that a small amount of free alkali in the finished soap is necessary to neutralize any unsaponified fat which may remain in the soap. The soapmaker argues that a little free alkali is a lesser evil than a trace of unsaponified fat, which will induce rancidity. Because of this hard and fast rule, toilet soap base is always finished on the alkaline side, and usually contains .05 to .12 free alkali as Na_2O. From the perfumers point of view this is a bad condition.

It must be realized that 1 per cent of perfume added to soap containing this amount of free alkali is in contact with a relatively massive quantity of Na_2O. Under such conditions it is not surprizing that Esters are hydrolized, Aldehydes polymerized, and other destructive changes induced with alteration and loss of perfume value. Higher figures on free alkali than above stated are frequently encountered. The soapmaker asserts that most of the free alkali is carbonated during the passage of the soap chips through the dryer, where the soap encounters large volumes of hot air. Even if the soap is neutral before adding the perfume, it is obvious that the alkali component of soap has a very high dissociation constant in water. Since all toilet soaps contain some water, they always have a definite alkaline reaction. The effect on perfume may be slow, but it is certain.

Keeping Properties Of Soap

White soap made from highly refined and bleached tallows and Coconut oil is a relatively unstable product, and readily oxidizes in air, unless an efficient antioxidant has been added. The final oxidation products consisting of complex Fatty Aldehydes and Ketones are responsible for the characteristic unpleasant rancid odor and the discoloration that accompanies it. The fate of a perfume in soap that has gone rancid is well known. Just a trace of rancidity can completely ruin a soap perfume. Under favorable conditions of warmth, moisture and free exposure to air over

a large surface area as in the case of soap chips, this oxidation can proceed at an amazing speed, with the evolution of considerable heat. The writer has seen a large mass of soap chips kept in a bin, that actually charred overnight and almost caught fire. Sometimes at the weekend shut down, a mere handful of soap chips trapped in some corner of a conveyor, would become so rancid, that they completely spoiled the first batch of perfumed soap passing from the equipment at the start up on Monday. A thorough clean up with a vacuum cleaner at the shut down was the only way to avoid this trouble. These instances are cited to prove the instability of freshly made kettle soap in chip form freely exposed to air, prior to the addition of an effective antioxidant.

The cause of rancidity in soap is now well understood. Some investigators have named the process auto oxidation, and have described the progressive chemical reactions that take place with the formation of highly active Ozonides. But it is more likely that traces of active heavy metal catalysts, Copper and Iron are responsible for initiating the reaction and accelerating its speed. All tallows contain naturally small amounts of copper and iron. It is usual to find 2 to 5 parts of copper, and up to 25 parts per million of iron in commercial tallows. They pick up copper from brass valves, pumps and other accessories. Soaps are manufactured in iron and steel equipment. Catalytically induced oxidation is bound to occur in the soap, unless an efficient antioxidant is added to prevent it. Some kind of antioxidant is absolutely requisite.

Antioxidants or soap preservatives

Even before the role of heavy metal oxidation catalysts in soap was known or understood, Sodium Silicate had long been added to toilet soaps as a preservative to prevent the development of rancidity.

It is now known that it worked by forming complex Silicates with the heavy metals, tying them up in nonionic combination, so that they can no longer act as oxidation catalysts. Consequently, Sodium Silicate is still commonly used in amounts up to .25 per cent as an effective preservative in toilet soaps. The highly objectionable feature about using Sodium Silicate is that it introduces additional alkali into the soap, and this has a very injurious effect on many perfume materials. It is also credited with having a harsh effect on sensitive skins.

Several good soap antioxidants are now known and used by the soap industry. Soaps that have been made from good quality tallows that have not been highly refined and bleached, have a natural cream color. It is found that such a soap has better keeping qualities, and is less liable to become rancid than white soaps. The explanation is that tallows contain natural organic bodies which have antioxidant properties, and tend to preserve them. In the case of white soaps, these natural preservatives have been completely removed during processing.

Stability Of Perfume Materials In Soap

Given a good white soap base, free from by odors, and properly stabilized by an effective antioxidant, it is not a difficult matter to determine which perfume materials give the best results in soap with reference to permanence and strength of odor, and color retention. From time to time, investigators on this subject have published lists of perfume materials which they have tested in soap under controlled conditions, and classified according to stability of odor and color. In many such reports, no mention is made of the use of an antioxidant in the soap. It is hopeless to try a series of experiments on the suitability of perfume materials in soap unless the soap, has been stabilized with an effective antioxidant.

Every soap perfumer should make long range ageing tests on single perfume materials in soap, containing an effective antioxidant. The single materials are added in suitable proportions, (ranging from .10 to 1.0 per cent, using the same boil of soap for the whole series of tests, when possible. The perfumed soaps, six or more sample size cakes of each single material are packed in flat tin boxes with good fitting lids, and lined with wax paper bonded to tinfoil to the exclusion of light and free access of air. A set of soap blanks are provided for comparison. The boxes of soap are stored in a convenient size steel filing cabinet. Such a storage cabinet will keep soap samples in good condition for years. The samples are systematically examined from time to time. The effect of ageing on the permanence of the perfume in soap, can be clearly determined, together with any color changes which may result. The cabinets are kept at room temperature, 60 to 95 Fah. The results are completely trustworthy. The same method may be pursued in the case of perfume compounds.

Keeping Properties In Perfumed Soaps

Although a great many tablets of cheap milled toilet soaps are made, displayed and sold without benefit of a wrapper, the fact remains that perfumed toilet soaps must be carefully kept from light and free access of air, if they are to reach the customer in factory fresh condition.

A perfumed soap is really a perishable product, and should be treated as such, but it is usually handled without care or precautions. It is kept in warehouses sometimes for many months, along with not so choice companions, and not infrequently near hot radiators. In retail stores it is displayed on shelves for weeks or months before being sold. When test purchases are made in a town or city, the serial numbers stamped on the soap reveal that in many instances the soap left the factory many months past. This is due to careless retail practices. Therefore to maintain quality, it is essential to use a well sealed outer display wrapper with an inner wrapper of impervious paper. The modern wrapper of Aluminum foil laminated to waxed or other impervious paper is a great improvement on the old type paper wrapper, and affords maximum protection from light and air, and slows down evaporation of moisture and perfume. Access of air to a cake of perfumed soap may result from imperfectly sealed wrappers, usually at the ends of the cake. This is where discoloration usually starts. Several perfume materials will cause discoloration under such conditions, such as the Nitro Musks, Ionones, Eugenol and others.

As a matter of fact, a cake of unperfumed soap will in time discolor at the ends, where air can enter.

The writer has an idea that Oxides of Nitrogen, traces of which are always present in the atmosphere, may start this discoloration, which is only skin deep. Tests have shown that when regular wrapped cakes of perfumed soap are kept exposed in an electrical laboratory, where the air contains a higher than normal concentration of Oxides of Nitrogen, (sometimes it can be smelled) owing to frequent electric discharges, this type of surface discoloration proceeds at a greatly increased rate.

Protection from actinic light is essential for the proper preservation of perfumed toilet soap. The Ultra Violet end of the spectrum is very active in causing destructive chemical changes and color development of soap and perfume. Many synthetic chemicals discolor when exposed to light, for example the Nitro Musks. Despite this liability, they continue to be used freely in soap perfumes. There is a great need for a synthetic Musk comparable in strength and cost to Musk Ambrette, and which does not discolor.

Pigments In Toilet Soaps

It is customary to improve the appearance and opacity of toilet soap by adding a suitable amount of a white pigment. Zinc Oxide was at one time universally used as a whitener in soaps. Later it was discovered that it had a deleterious effect on both soap and perfume, because of its property of acting as an oxygen carrier. In fact it is a mild oxidation catalyst, and is so used in certain chemical reactions.

Titanium Dioxide, Ti.02, the whitest of all white pigments is chemically inert and free from all objections. It is the preferred soap pigment today.

Colors In Toilet Soaps

The apparent whiteness of a white soap may be enhanced by the addition of a trace of a suitable blue dye, which cancels a cream or off white shade.

For many years, the public preference was for white soaps, which indicated purity and fine quality. In recent times this idea has been superceded. The same brand of soap is offered in pastel shades of pink, yellow, green and blue. The modern woman has found an added attraction in colored soaps, which harmonize with the decor of the bathroom. These delicate pastel shades must be made on a pure white base.

Synthetic Detergent Bars

In recent years, the soap perfumer has been called upon to furnish perfumes for the new synthetic detergent bars, which have been introduced to the public by the large soap makers. In most instances, these detergent bars can be perfumed with relative ease compared with soap, and the perfumed bar maintains a good odor over long periods of time. In general, detergent bars are neutral in effect, and the unfavorable reactions on perfume materials that exist in soap, due to its high dissociation constant, are absent or greatly mitigated. The lessened alkalinity of detergent bars has also the important advantage of conferring mildness in use. It also permits the use of a wider choice of perfume materials. In some cases, difficulties in perfuming detergent bars has occurred because of persistent, hard to cover base odors inherent in the surfactant used.

It is interesting to note that the fragrance types found in commercial detergent bars are different to those normally associated with toilet soaps. Here we have a new product with new unique features substantially different to soap. The concept of novelty is carried through even to the fragrance used. These in general are of the type which can best be described as refreshing, bracing, piquant and stimulating to the senses in the bath tub or shower.

Here is a good opportunity for the perfumer to create new perfume types, and to take advantage of the newer aromatics offered by the Perfume Industry. The trend in perfuming detergent bars seems to be toward more expensive blends used at higher levels. Little information has been divulged about the formulation and manufacture of the new detergent bars. This is understandable. It can be said that no new product required more years of exacting research to overcome the numerous difficulties encountered in formulation and manufacture, before a satisfactory bar was ready for mass production and sale. The finished article had to resemble a cake of milled toilet soap in appearance, texture and performance. Moreover it had to be designed for ready manufacture by the regular milling and plodding process as for milled toilet soaps.

A variety of surfactants can be used for the manufacture of detergent bars. The surfactants in common use are the Fatty Alcohol Sulphates, the various Methyl Taurides, and the Alkyl Aryl Sulphonates. The main body of the bar may consist of soaps, fatty acids and other plasticizers, resulting in a relatively complex system in which tolerances in content of the several components are small. Equally important and critical are the processing conditions for successful production of the bar.

The success of the perfected modern detergent bar has been spectacular. The product has many significant advantages over regular milled toilet soap. Its low pH and resulting mildness. Its superior cleansing and lathering properties and absence of scum formation in hard water have been quickly recognized and appreciated by users living in the widespread hard water areas in the United States. These outstanding features combined with the addition of active new germicides and refreshing new fragrances are a notable advance from the days when the main claims to superiority were whiteness and purity.

The familiar cake of milled Toilet Soap faces a formidable competitor. In the future, it seems likely that more and more detergent bars will be sold in place of milled toilet soaps.

We know what happened to packaged laundry soap powders when detergent products appeared and supplanted them in public favor. Scores of huge soap kettles were left empty and unused.

Will regular milled toilet soaps be supplanted by detergent bars? The next generation may not know what a piece of milled soap is like.

THE END

The Qualified Consumer Panel for Fragrance Evaluation

BY DONALD H. BUSH
Fritzche Brothers, Inc.

Perfume supply houses, today, have been forced to learn more about the many different aspects of the cosmetic industry with which they are dealing. It is most important for us to keep abreast of all the new cosmetic ingredients and packaging materials. It is also an advantage to know the sales philosophy of our customers and their methods of selecting the all-important fragrances for their new products. In connection with the latter, the majority of cosmetic and toiletry manufacturers use some form of paneling in the selection of fragrances for their products. It is paneling regardless of whether opinions are solicited from a number of people or just a few. It is done primarily to avoid spending a great deal of money launching a new product only to find that sales are greatly hampered by a fragrance lacking in consumer appeal.

We in the perfume raw material business have attempted to adopt some of the techniques employed by our customers. Previously the selection of samples sent to customers was determined by the preferences of the chief perfumer, sales manager, expert panel, or perhaps the president's secretary. We, too, at Fritzsche Brothers, Inc., have tried some of these approaches but feel that our new method—the qualified consumer panel—has many advantages over past procedures.

Our Qualified Consumer Panel consists of men and women possessing a keen, discriminating sense of smell. In the selection of its members there is only one requirement: *that the panelists have no knowledge of perfumery.* For all they may know, phenyl ethyl alcohol is something that goes into the making of Martinis. This lack of technical knowledge is most important; it gives us a better consumer opinion as opposed to the expert opinion. We feel it is difficult for the expert or the perfumer to be completely objective in the choosing of fragrances. For example, one may hear a perfumer say about a perfume that has been recently introduced to the public, "This is a fine fragrance—and it should be, because it is loaded with jasmine absolute." A perfumer generally studies a new fragrance and almost immediately begins to analyze the various raw materials it contains. This is due primarily to his extensive training. He also quickly recognizes classic types of fragrance and is aware of their potentiality in large sales volume. None of these thoughts enters the minds of our talented novices. They will judge a fragrance—whether it be incorporated into a cosmetic cream or in a fine perfume extract—by the overall effect. We do not mean to say that experts cannot make the same kind of judgment but we are looking for the opinions of people who normally purchase these products.

Our next step in choosing the panel is to conduct a series of tests to determine who has a good nose. We feel this is an inherent quality similar to any other sensory faculty. The sense of smell varies greatly with individuals, just as acuteness of eyesight and hearing vary. This was made clear through our testing.

Some 40-odd persons were tested and after the results were tabulated seven women and three men who received the highest scores were chosen. The test takes in five different categories with a percentage of importance placed on each one.

1. The first category is designed to measure the ability to judge quality and a numerical value of 40

points (or 40%) is placed thereon. This, we feel, is the most important phase of our test. If a person is unable to judge a good odor from a bad one, he is worthless in paneling whether on a large or small scale. On large panels we have observed many erroneous answers to leading questions, indicating that many people lack a dependable sense of judgment in fragrances.

The potential panelist is given three blotters, each impregnated with a different grade of finished rose complex and is asked to number them in the order of preference with respect to quality. The cost of these compounds was not a determining factor; there had been complete agreement on the part of our perfume staff with regard to the relative quality of the compounds. A wide difference in quality exists in the three rose compounds from one which is extremely harsh and chemical, to the other extreme—a beautiful, well blended tea rose.

The same test is carried out with three other fragrance types—a lilac, a French classic bouquet in perfume solution and a jasmine-spice in typical cream formulation at the rate of 0.5%.

2. The second category is referred to as our "odor perception test," twenty points (or 20%) being assigned to this portion of the test. A perfume raw material is placed on blotters at varying strengths, specifically vanillin, phenyl ethyl alcohol and oil sandalwood, at the following rates:

Vanillin	Phenyl Ethyl Alcohol	Oil Sandalwood
1 part per 150	1 part per 150	1 part per 500
1 part per 250	1 part per 250	1 part per 750
1 part per 350	1 part per 350	1 part per 1000

These materials are to be chosen in the order of strength. When our skilled panel is finally chosen we realize that our group is above average in distinguishing odors at low levels. This information assists us for their cosmetic preparations.

3. The third category is the "quartermaster triangle test" which indicates the ability to distinguish one odor from another, ten points (or 10%) being allowed for this portion of the test. For example, geraniol is placed on two blotters, citronellol on a third; these two aromatics are of the same family in odor character. The person qualifying for our panel is asked to indicate which two of the three blotters are identical. The test is then performed with a classic aftershave lotion. Two blotters are impregnated with the original and another with a slight revision of the original formula. We believe this test is of great value because consumers are quick to perceive any change or variation in a product; we are interested in finding people who can spot these differences.

4. The fourth category is the "odor memory test" to which we assign 20 points (or 20%). Five blotters are submitted, each one impregnated with a classic fragrance, each bearing the name of the perfume. The potential panelist is requested to study these fragrances for five minutes during which time he is allowed to make such notes as "woody," "flowery," or other descriptive words that would assist him in remembering the perfume. The blotters are then taken away and the same five fragrances are submitted (unlabeled) with the request that each one be identified. A list of the perfumes is also given so that there will be no possibility of the testers forgetting the names; however, this relatively simple test is not easy to do without previous training. "Odor memory" is undoubtedly an important factor in determining who has a good nose. From a consumer standpoint we are interested in finding people who can remember different fragrances.

5. The fifth category is "odor association." Five classic toilet waters are selected and two blotters are impregnated with each of the five fragrances. The tester is asked to match the five odors in pairs from the ten unlabeled blotters. This is just another exercise to determine his fitness for the panel.

The initial testing procedures are quite time-consuming. In putting each individual through the five categories mentioned above, the tests should be carried out over a five-day period because there are variable factors contributing to one's ability to smell: the time of day, conditions of health, atmospheric condition, and odor fatigue. This small panel, once selected, operates quickly and costs are negligible. Once the panel is in operation it is easy to determine the fragrances to be submitted to our customers. We might ask six members of our perfume staff to submit one fragrance each; our panel will then be asked to select the fragrance they prefer.

Qualified Consumer Paneling should help cosmetic and toilet manufacturers in pre-paneling a number of fragrances for elimination. If time and money permit, a large scale panel may be conducted. When we submit samples to our customers we feel that they represent fragrances which will have popular appeal based on the results obtained from our Qualified Consumer Panel.

Methods of paneling are subject to debate. There is no fool-proof method to insure success in the introduction of a new perfume, toilet water, or perfumed cosmetic. However, Qualified Consumer Paneling involves a calculated risk which is more certain than the opinion of a single expert.

Present at the Technical meeting of the Toilet Goods Association were: Dr. H. Wilmsman, Frank Berger and Eugene Megerle of The Wella Corp. and Dr. H. Heinrich and John E. Clements of Coty Products Corp.

Space Deodorants

. . . . . Opportunities Ahead

BY A. HALDANE GEE, PH. D.
Foster D. Snell, Inc.

Space deodorants and air fresheners stand midway between luxury goods and household essentials. The field is fascinating, with the aerosol package and air conditioning presenting vastly increased application possibilities. And there is every prospect of volume business, at a good price, and of specialty products, at a better price, for as long as one can see ahead.

The present opportunity with these materials is partly a matter of right timing and partly a matter of expanding technology. Public acceptance is tied in with an increasing general awareness of odors and of the sanitary—or esthetic—quality of the environment, be it of the home, office, department store, place of assembly or entertainment. The technology of odor control is not yet, however, of full stature, and here lies the real challenge. There are many products on the market, some with real merit, and usually with moderate claims, and others making rather sweeping claims which may or may not prove valid in rigorous testing. At least one pioneer product, soundly promoted, is a large seller, probably the largest seller. There are also flashier items that may do the field some commercial harm if Mrs. Consumer decides or Mr. Purchasing Agent discovers that one touch may indeed not produce instant, lasting relief.

Odor control agents may appear elusive in use since they become invisible, almost imponderable, while accomplishing a result that is apparent only to the nose—and the nose although discriminating is subject to fatigue and other vagaries. The sense of smell can nevertheless become nicely quantitative, not only as to odor control agents but also as to the malodors that they are intended to abate. Also the individual may respond as a whole—with feelings of pleasure or of discomfort and even distress, depending on the vapors he consciously or unconsciously inhales.

Three Types

Currently available materials may be placed in three general categories: conventional odorants, sophisticated ingredients, chemical exotics. These may be used in various combinations. In the conventional class are the essential oils—florals, spices, wood oils. Some of the sophisticated materials, which may have moderate odors of their own, are believed to reduce malodors without adding appreciably to the general odor. The chemical exotics, of which several are being marketed, are said to remove malodors by one process or another without adding new odor components.

For further discussion of the action of these several types of materials, one has to resort to descriptive terms that are found in publications on odor technology and the sense of smell, although some of these terms are often loosely used.

The essential oils are usually employed as masking agents or "reodorants", where a pleasant or acceptable odor is used to cover a less pleasant or objectionable odor. Ordinarily the one odor can be detected in the presence of the other, so that an appreciable level of perfume or fragrance may be required for a significant diminution of the unwanted odor. Obviously there is a limit to the amount of masking agent that may be used in occupied space. The applied agent should not be unduly obtrusive, nor at variance with the personal odor preferences of the occupants of the space, nor should it cause a conflict with the unwanted odors by reason of unsuitability or possible exaggeration of the malodor through some undesirable synergistic effect.

Although the masking agents have useful applica-

The author of this article is Director of Bacteriology and Toxicology, Foster D. Snell, Inc., New York, consulting chemical and engineering firm. Dr. Gee's assignments include spoilage and contamination problems, odor control, consumer acceptance and irritation testing of chemical specialties, precautionary labeling requirements, advertising claim substantiation. A four-part report on the control of odors in aircraft, published by the United States Air Force, was based on a two-year investigation in the Snell laboratories, conducted by Dr. Gee's group.

tion, especially in aerosol form, their great variety suggests diverse and not wholly successful attempts to solve the household odor problem.

The sophisticated materials, sometimes described as cancelling or modifying agents, are volatile materials, frequently with a light, nondescript odor or one with no special association, pleasant or unpleasant. Many of them are derived from or are similar to natural materials, 6-carbon aliphatic compounds and above—aldehydes, ketones, related compounds. Some are short chain substituted aromatic compounds. Carefully controlled tests show that some of these agents will reduce certain malodors without an accompanying increase in the level of the control agent.

The cancelling agents may be used in conjunction with frankly masking or reodorant materials, usually as empirically developed mixtures. Their use has a theoretical basis, although there are complications in practice. There are classical demonstrations in the field of odor physiology indicating that pairs of characteristic and usually dissimilar odors may cancel one another if presented to the nose in suitable proportions. Occasionally the one odor may be detected in the presence of the other, but the sensory effect of the right mixture is much less than that of either component of the mixture alone. Unfortunately, there are many practical difficulties in the way of utilizing this phenomenon for space deodorization. The malodors are usually complex. It is difficult to introduce a measured amount of the opposing agent. The overall level of odor has a bearing on the impression the combination makes on the nose. And there is question in many cases as to whether the cancelling effect is attributable to some loose chemical combination apart from the human observer, or whether the cancellation takes place in the brain.

Exotics

The exotic chemicals, (usually synthetics unrelated to aromatic materials) are sometimes presented as wonder agents that solve all odor problems, no matter where applied or in what manner. One or two of these may have merit in special situations, but in some cases the claims are broader than the proof is firm. An odorless material that can be used freely to cancel or counteract unwanted odors is indeed desirable. But there is question as to whether certain materials for which this property is claimed are indeed innocuous if used freely, or frequently. If utilized in aerosol form, also, they may produce effects that may be achieved by almost any kind of a spray —by bland aerosol, by spraying various emulsions or even by fogging with plain water. For proof or disproof, it is necessary to resort to extensive, exacting test procedures that require special facilities and technical personnel accustomed to working objectively in the field of odor evaluation.

Selected compounds from one class of exotics, the quaternary ammonium compounds, are periodically recommended for deodorizing space as well as for treating odoriferous or potentially odoriferous surfaces. Regardless of their possible value for mitigating unspecified odors in the air, the quaternary compounds may be employed as residuals on surfaces where bacterial action or mold growth may occur. Properly

Diversity of odor control products is strikingly evident in display of some 600 items collected from world markets for odor library of Airkem's New York headquarters.

applied, they may eliminate mildew or other off-odors of microbiological origin. This is a well recognized use, where the control agent is applied to the surface where the odors may originate, and the contamination of the air is thereby prevented. An extension of this is the use of antibacterial agents directly in dusting, sweeping and mopping materials, incorporating highly active compounds of mercury, as well as a variety of organic germicides. So used, these further agents qualify as space deodorants.

Air Sanitizing

Some room deodorant formulas include glycols as supplementary ingredients, usually propylene glycol or triethylene glycol, or a mixture of the two. These are miscible with most other ingredients, hence should not present undue formulating or stability problems. Their function, however, is mainly as air sanitizing agents. It is doubtful whether they contribute directly to the odor control properties of the mixture.

These two glycols have useful antimicrobial effects when used as mists in the air, even at low concentrations. They are effective against viruses as well as against bacteria. But the conditions of home use—or

the amounts of glycols applied—will seldom justify a claim that the product is germicidal or capable of killing all of the bacteria. The lesser claim, of air sanitizing action, is nevertheless a useful one, although it must be based on proof of effectiveness.

If the count of air borne bacteria can be shown to be reduced to some low level in a practical test, the sanitizing claim is admissible. If the reduction is only partial, then a modified statement such as "aids" in air sanitizing may be allowable. All such products, with claims for sanitizing effect, will require registration with the U. S. Department of Agriculture, if entering interstate commerce.

Air "Freshening"

In any air "freshening" operation, two important factors are the relative human occupancy and the amount of absorptive material that is exposed. The rate of air change is obviously important also. Persons newly entering the space will be more aware of malodors—also of possible counteractants—than will those who have been in the room or premises for some time. The use of draperies, fabric upholstery material, heavy pile rugs will tend to promote odor "cling", as in the case of stale tobacco odors on the one hand, or with a heavy odor masking agent if it is used repeatedly.

The outside air problem is one that fosters space deodorants. Although still the best and most natural method of odor "control", the introduction of "fresh" air presents a variety of problems. In wintertime, fresh air from outdoors may cause drafts and complications with the heating system. In summertime, a high ratio of fresh air makeup necessitates a heavier air conditioning installation. In the in-between seasons, the fresh air in urban communities and in manufacturing areas is no fresher than the ambient air of the outdoors, with whatever pollutants it happens to contain.

Here, beyond the hand dispenser, one finds the portable room treating unit, and the attachment for the room air conditioner, available in various sizes. One can visualize the central system for the home which may eventually become standard equipment, after major problems in regulation and distribution have been solved. All, however, point to a heavier consumption of the control agents, and a greater diversity of methods of application, including with solid materials such as the treated gel sticks used in Airkem's new application equipment, which are self-feeding and evolve active material at a controlled rate.

Technical Problems

Some of the unsolved problems in the practical application of room deodorants are closely tied in with the technical complications that arise whenever relative effectiveness is to be measured, or comparative evaluations are sought. Variable or unexpected results under service conditions may be related to unrecognized sources of error when the materials are laboratory tested. There nevertheless are meaningful research and comparison methods for space deodorants that have been worked out on a common basic pattern. These procedures are used in a limited number of laboratories, and this is where the more sophisticated materials are being developed and tested.

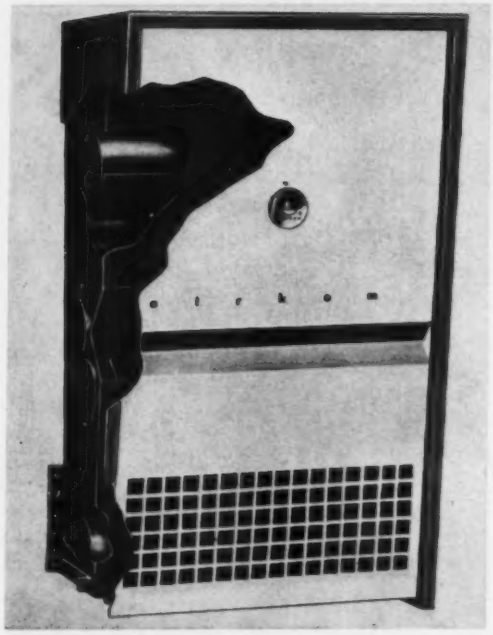
Inhalation of odorant mixtures on stream is sensitive test method employed in odor evaluation laboratories of Foster D. Snell, Inc., New York City, for appraisal of malodor, masking, modifying, or cancelling properties of active agents.

All such tests still depend on the evaluation of odor mixtures by a panel of experienced observers. The requirement here is to make a subjective procedure objective, by the use of controls or knowns, blind samples, matchings, concealment of visual clues, and similar techniques customary in making sensory panel determinations. These methods are time-consuming, but they do give valid results. An instrumental or strictly analytical approach to the problem would certainly be desirable, but suitable methodology is not yet available—and the properties of most odorants are not sufficiently well known. Some spectroscopic procedures are under investigation, and so are radioactive tracer methods. All such work, however, is still in the pioneering stage, whether regarded as an exercise in sensory perception, or as a fruitful field for philosophical speculation.

To the uninitiated, a trial of a sample space deodorant might seem to require nothing more complicated than a suitable test room, an extemporaneously generated malodor or combination of malodors, and a squirt or two of the deodorant on test. In practice, this seldom yields useful data. The effect of absorption by the objects and surface coverings of the room has been mentioned. Problems of mixing, diffusion and persistence of the odors arise. The observers are subject to sensory fatigue. Weather conditions are important.

Screening Methods

To avoid these problems, the odor laboratory usually carries out preliminary or screening tests in glass containers in which odors mixtures can be prepared and sniffed by the panel of observers. Control of the amounts introduced may be achieved by making



Space-treating units of Airkem use wick type of dispenser with circulating fan (above) and self-feeding gel stick type for attachment to air conditioner (left). Wick type uses liquid product. Gel type is loaded at one servicing.

dilutions of saturated vapors of the components. The effects are usually expressed in simple numerical scales of intensity such as the following or some modification of it:

Odor Scoring Scale

0 = no odor, or no odor of the designated component,
1 = threshold level of the component,
2 = definite odor of the component,
3 = strong odor of the component, and
4 = overpowering odor of the component.

Each observer decides for himself the intensity level of each of the known components. He must also be on the alert for any new odor resulting from blending or modification of the odors introduced into the mixture. This gives two dimensions—the characteristics of the several notes or components and the apparent intensity of each. A third dimension is provided by an observation as to whether the results are pleasant or otherwise. Here the observers may differ, despite substantial agreement as to the identification and intensity of the components. Preference, accordingly, is usually the least useful element of the judgment, contrary to the expectations of the inexperienced.

A further element in the standardization of the testing is the use of reproducible malodors representing different situations such as a cooking and kitchen odor combination, a stale tobacco mixture, and a bathroom or stale perspiration type, with separate tests against each of these malodors. Candidate malodor mixtures must be equally suitable for release in glass laboratory containers, and in occupied space in subsequent testing, without change of character.

Triplicate Test Rooms

For confirmatory use testing, in which the observers breathe the odor mixture, it is possible to use inhalers or face masks on an air system into which a malodor and control agent can be introduced continuously in varying proportions. This requires precise methods of metering. A more common approach is the use of specially designed rooms into which the materials can be introduced. Ordinarily such rooms are built in triplicate for studying the minimum problem of: malodor alone, control agent alone, and the mixture. This permits simultaneous observations, a considerable advantage over attempting to create and appraise the three conditions in turn in the same room.

Such test rooms are usually built with non-porous and washable floor, walls and ceiling. Temperature and humidity control are important along with adequate methods for introducing the odor components and for purging the system afterwards. One of the most elaborate installations for the purpose was constructed several years ago in the Cleveland Research Laboratory of the American Society of Heating, Refrigerating and Air Conditioning Engineers. Considerable basic odor control research has been conducted with this equipment. There are similar facilities in other laboratories engaged in odor investigation, although such equipment is not common. It is expensive to build and expensive to use—but it is invaluable for critical resolution of some problems in space deodorization.

Technical progress in this general field has been rather erratic thus far, with considerable general knowledge available, but not utilized fully by some segments of the industry. To some manufacturers, the space treating materials are not too different from materials applied to the person—a gross perfumery operation. By contrast, more enlightened manufacturers are investing in research in depth which is paying off in sound products that justify claims for superiority. Probably one of the most assiduous of these is Airkem, which has a number of advanced materials and methods of applying them.

Off to one side are certain of the exotic chemical products, where broad claims may rest on rather superficial foundations. One of the aspects that may be a cause of concern is the need for extensive toxicity testing of newer materials which may be inhaled for long periods. For these, the results of brief exposures of animals or of short term toxicity tests are scarcely a sufficient clearance.

A possible future development is in the area of government regulation. At present, the only restrictions are those dictated by safety requirements, hazardous substance labelling laws, and the usual restraints on unfair trade and competition. If sanitizing action or germicidal value is claimed, however, then interstate sale brings the product under the Federal Insecticide, Fungicide and Rodenticide Act which is administered by the U. S. Department of Agriculture. More specific regulation of room deodorant materials has been considered, most likely under the wing of the USDA, when and if it takes place.

Institutional Applications

Although this discussion has been directed mainly to household products, there is a similar and increasing institutional field. Here the results need to be more positive, but the application problems are more complicated. A saving feature is the fact that skilled help and suitable supervision are usually available (building service personnel) so that inadequate or unpleasant results are less likely.

A further outlet for odor control materials is in the industrial field, where processes or products may present odor problems that call for correction, in the one case to control a nuisance and in the other case for sales reasons. These, however, are usually special applications.

For completeness, two space treating agents are included that do not fall into any of the foregoing classifications. One is chlorophyll and the other is ozone. The one has had wide sale, questionable value. The other has had sporadic sale, real potential value.

Despite the variety of products in which chlorophyll has been used, and despite whatever it may do in nature, there is still no complete, fully controlled, convincing proof that it has any real odor control value as an ingredient, in a cosmetic or in any other household product. A survey of consumer opinion on this point would be illuminating.

Ozone, properly used, comes closest to a true cancelling, indeed destroying agent for many kinds of odors, especially those originating with decay, or animal or human metabolism. But the problem here is to have the agent available without causing harm to life, which is adversely affected by even small amounts of ozone. One answer is to treat space intermittently, because ozone rapidly reverts to oxygen. Another is to control the application so that oxidizable malodor is always available. Here industrial applications will likely grow more than small scale applications, because the problem of control is less formidable. But even here, ozone, no more than most other useful products, will not do everything—it does not, for example, react with ammonia, although other materials will.

At the Toilet Goods Association Technical meeting at the Waldorf were: Henry Eickmeyer, Schimmel & Co. Miss M. A. Farina, and George H. Fuller of Colgate-Palmolive Co.

SCC Conferees: I. R. Hollenberg, Knapp Products, Inc., SCC program chairman Allen Newcomb and Richard Malmstrom of Malmstrom Chemical Co.

SCC Conferees: Edward P. Gorham, Evans Chemetics Inc., Edward Leonard, Sared Laboratories, Walter Edman, Evans Research & Development Corp.

Adapting a fragrance theme to a "Line"

BY J. R. ELLIOTT
Consultant

Let us first define the meaning of "line". It covers perfume, cologne, powders, bath oil and salts, cosmetics, soap, shampoo and lipstick.

The initial problem of the perfumer assigned to create a fragrance for a complete "line" is the selection of a theme which he feels reasonably confident can be consistently reproduced throughout the various price and technical restrictions of his projected "line". It is a major undertaking and requires much thought and exploration for success.

In addition to these "line" problems the perfumer at the same time must consider the eight factors recognized as existing in every successful fragrance. He must try and work them into every fragrance or technical modification he intends to use.

The ideal fragrance involves four artistic factors: Pleasantness, elegance, originality and "recall"; and four practical factors: Persistence, intensity, balance and chemical stability. Technical and price restrictions may force him to compromise, but he avoids this as much as possible.

It should be noted that the technical problems arise largely in the "line" items other than perfumes and colognes. Many European manufacturers are concerned only with perfumes and colognes while Americans more often offer a wide fragrance "line".

This situation puts a far greater pressure on the American perfumer than his European confrere. He must not only be a creative artist, but an ingenious chemist as well, in order to successfully carry his fragrance throughout his "line". All too often the American perfumer is unfairly criticized by comparison with his European counterpart because this essential difference is not too well known.

Now, let us take each item of a "line" for a brief individual discussion, beginning with the perfume. To facilitate matters we will take a simple Jasmin formulation as the theme.

Perfume

The perfume has the highest cost allowance for its "oil", of any product in the "line" since it is the "showpiece" that sells the other parts. Its liberal cost tempts the perfumer to "shoot the works" and make a superb original fragrance. But he must be cautious and avoid overloading his perfume oil with costly raw material such as absolutes, specialties and rare chemicals which cannot be easily substituted in the various versions of the fragrance that must follow to complete the "line". Similarly, for practical reasons he must avoid materials known to have high discoloration properties, or which are prone to chemical change, under the conditions of the subsequent line. The perfume sets the pace for the whole line, and care must be taken that its theme is reasonably reproducible throughout.

As our demonstrator we will use the following Jasmin perfume. This is an expensive product with its use of Jasmin Absolute, Ylang Absolute, Myrrhe Oil, Ironiane.

JASMIN PROVENCALE

1300	Benzyl acetate
700	Linalool
150	Linalyl acetate
125	Ylang Absolute Epure (Robertet)
150	Indole 10% in Benzyl alcohol
400	Amyl Cinnamic Aldehyde
250	HexylCinnamic Aldehyde
50	Jasmin ketone (Verona)
30	Benzyl propionate
20	Benzyl formate
10	Neroflor Savon, (Verona)
30	Oil Cananga
10	Aldehyde C-12 MNA 10% in DEP
50	1% Phenyl Propyl Aldehyde in DEP
10	Phenylethyl Alcohol
10	Oil Myrrhe
10	Aldehyde C-14 10% in DEP
40	Ironiane 10% in DEP (Perfumery Associates)
100	Jasmin Absolute

Cologne

The cologne is the largest selling item of a "line". Its oil is basically a less costly version of the perfume oil. The cologne oil requires a greater power and diffusiveness than the perfume since it is used in a more diluted form. Therefore the cologne oil contains the basic fragrance elements of the perfume type plus a liberal amount of citrus effects for boosting.

To change our Jasmin perfume to a cologne we must make a series of cost reductions. The Ylang Absolute is replaced by Ylang Premier which has about half the cost. The Myrrhe is substituted with "Myrrhone" (Polak Frutal) for a similar reason. The astronomically expensive Jasmin Absolute is replaced with "Jasmin Acetate" (Robertet) for about 15% of the cost. If desired, the Hexyl Cinnamic Aldehyde can be replaced with Amyl Cinnamic Aldehyde.

To give the additional cologne "lift" we would add 100 Bergamot Oil and 30 Oil Olibanum Distilled. The latter adds a "lift" but is more harmonious with the Jasmin type of odor. Too much Bergamot tends to develop a fruity odor as well as a "lift".

Dusting Powder, Talc

These products require a low priced oil possessing great stability towards oxidation and polymerization. The immense surface area of exposure offered by powders, and the alkalinity of their vehicles, favors both these chemical reaction. The latter can be extremely destructive of a fragrance.

In powders the essential oils are subject to the development of terpene odors because of oxidation. Aldehydes will decompose to acids or polymerize to resinous, odorless masses. The indoloid complexes tend to oxidation with the formation of reddish brown dyestuff-like products.

Returning to the original Jasmin perfume formula, we would replace the 150 Indole 10% with 100 Indophlor Extra (Verona) to eliminate the problem of discoloration. This modern material, onyl recently introduced, makes the formerly serious problem of Indole replacement a comparatively easy matter. The exact use of Indophlor Extra will have to be determined by the individual perfumer according to what he expects from a Jasmin fragrance.

The Ylang Absolute, Jasmin Absolute and Myrrhe Oil should be replaced as in the cologne.

To give the sweet powderiness usually associated with these products we would add 50 musk ketone plus 10 musk ambrette and 10 musk xylol. Optionally there can be added 5 Heliotropine.

Note carefully that bergamot is not used because it is a decomposable essential oil.

10 benzoic Acid may be added to help counteract the surface alkalinity of the vehicle. To assist in resisting oxidation, 5 "Ionol" an anti-oxidant (Shell Chemical Co.) may be introduced.

Bath Oil, Bath "Salts"

Bath oils are relatively simple to make and present little technical difficulties. The "oil" is usually sesame oil since it is inexpensive and of minimum sensitivity to the skin. It should be recalled that sesame oil is used for the solution of drugs to be injected under the skin. Sometimes myristic esters are used because of their famous "water barrier" action.

In these oils the principal problem is solubility since solutions of the fragrance oils are often made at 40% level. If the fragrance oil used for the cologne gives a good performance it is generally employed for this bath oil situation.

The principal difficulty encountered in bath oils is centered in the oriental type of fragrances wherein large amounts of natural resins are used. The latter often contain substantial amounts of insoluble polymers which cloud up the bath oil.

Bath salts, however, are another matter. They pose the same problem as powders, with the added annoyance of strong alkalinity. To this are added the actual hydrolytic destruction of the fragrance oil and intensified discoloration because of the powerful alkali present. Oftentimes it is necessary to make heavy compromises in fragrance type to avoid difficulties with these salts.

To adapt our original Jasmin perfume formula to bath salts we would make a number of changes.

The Ylang Absolute would be replaced by Ylang Premier as in the cologne version. The Indole 10% would be replaced by the new Indophlor H&R (note: this is NOT the "Extra".) Hexyl Cinnamic aldehyde would be replaced with Amyl Cinnamic Aldehyde. Benzyl formate, Aldehyde C-12 MNA, Phenylpropyl aldehyde and Ironiane would be omitted because of their known risk of hydrolytic reaction. The Jasmin Absolute would of course be dropped both for price and technical reasons. We would not recommend its substitution.

The drastic changes leave a rather stripped down formulation and some of the fidelity of the Jasmin fragrance has been compromised. It is a good illustration of the necessity of fragrance sacrifice to meet technical requirements.

Cosmetics

This is a complete field in itself. A book could be easily written on this "line" member, so this section of my article must be unusually concise.

The greatest artistic sacrifice of the entire line is required in order to obtain a successful cosmetic version of a given fragrance. Discoloration is a prime

problem followed by those twin bugaboos, irritation and allergenic reactions.

Because of these factors the cosmetic fragrances are "distant" relatives of the "line" odor (i.e.: the perfume). To compensate for this loss, emphasis is placed on the suggestion of feminine fragility and delicacy. Elegance and daintiness are more desirable in cosmetic fragrances than intensity and novelty. The flamboyant and exotic effects make a cosmetic look cheap. The cost of cosmetic fragrances usually runs in the range of the colognes or a bit less.

To adapt our original Jasmin perfume formula for costmetic work we would make the following series of changes.

The Indole 10% would be replaced with Indophlor Extra (Verona). We would omit the Benzyl formate, Cananga Oil, Aldehyde C-12 MNA and Phenylpropyl aldehyde. Both the Ironiane and the Jasmin Absolute would be dispensed with because of irritation and discoloration factors.

To compensate for the loss of floweriness caused by these omissions we would make these additions: 100 Tolyl Acetate, 30 Rose WN (Perfumery Associates). This combination produces a sweet floral note that creates an effect of elegance.

Lipstick

Lipstick fragrances require the introduction of some kind of flavor effect. Usually this is achieved by blending into the cologne version of the fragrance, a compatible flavor effect. For example: Rose works well with Strawberry; Jasmin with Raspberry. Fancy florals favor Strawberry, Raspberry and often Pineapple. Oriental fragrances harmonize well with Orange and Lemon, and occasionally Terpeneless Lime. If an extra sweetness is desired a 2% solution of Palatone in Phenylethyl Alcohol may be added at discretion. Bergamot should be avoided because the bergaptene contained in it produces allergenic reactions on some people.

To adapt our Jasmin perfume to lipstick we would use the cologne version minus the Bergamot. To this we would add about 10 parts of the 2% Palatone solution mentioned above. Then we would introduce a Strawberry concentrate to taste.

Soap

Like cosmetics, soap work is a tremendously specialized field in itself. Its fragrance oil must be the cheapest of the whole line. Because soap is a highly compressed medium, its perfume oil must have great intensity to reach effective recognition.

The oil must be exceptionally stable towards alkali and free of easily oxidizable materials. It must be free from discoloration and "spotting". The fragrance must have instant appeal on smelling from the cake, as fragrance is at least 50% of the sales appeal of soap. Price requirements often force as much deviation from the parent odor of the perfume, as technical needs.

To reduce the parent Jasmin perfume oil to a soap formula we must make the following extreme changes:

The Benzyl Acetate should be increased to 1500.

The Ylang Absolute would be replaced with Cananga.

Replace the Indole 10% with Indophlor HR (Verona). Note: this is *not* the same material as the "Extra".

Replace the Jasmin Ketone with a 10% solution of Para Cresyl Acetate. This change "kicks up" the floweriness but in a less refined manner.

Omit the Benzyl Propionate and Formate, and the 30 Oil Cananga.

Omit the Aldehyde C-12 MNA, Phenylpropyl Aldehyde, Myrrhe Oil and Ironiane.

These changes reduce the original formula to a pretty shabby state, but they illustrate the kind of adaptation that must be made for the American market. Our European counterparts are allowed a much more liberal cost for their soap work and the results speak for themselves. But it should be also remembered that their products are sold for a premium price, not at the supermarket.

Shampoo

Fragrance in a shampoo is used largely for creating an initial fragrance appeal. Thus when the buyer smells the bottle of shampoo the fragrance should not require a physical effort for identification. However, the fragrance concentration should not be too great as it may leave a residue which will conflict with other fragrances the user may wish to wear.

For shampoo work we would select the same version as used for bath salts. The soap version can be used, but it is a little too shabby for a "class" item like the shampoo.

Final Comment

We hope that this article will be read by perfume executives and may help to clarify some of the misunderstandings between management and the perfumer. As can be seen, the lot of the perfumer is not an easy one; his problems are many and hard. Perfumery is not a simple matter of juggling a few chemicals. It takes talent, patience, and above all, time, to produce an attractive fragrance.

If our humble literary contribution does no more than create a little sympathy and understanding for the perfumer and his troubles, then we will consider our effort amply rewarded.

SCC Conferees: George G. Kolar, President Kolar Laboratories, Inc., Richard P. Reavy of John H. Breck, Inc. and C. "Pete" Clapp, Western Filling Corp.

Lotion & Cream Sachet

BY WALTER A. TAYLOR
The Dispergent Co.

A new look at lotion and cream sachet presents an unexplored potential for market expansion. Products of superior fragrance qualities and greater utility are now possible with a unique type of emulsifier. A lotion and cream system of outstanding cosmetic quality combines emolliency, softening and soothing action and still retains a true perfume note. For additional appeal beneficial additives may be incorporated for their specific effect. The appropriate choice of emulsifier permits the use of relatively low perfume concentrations favoring the use of the sachet over a greater body area.

Much of the past effort in presenting perfume to the public has been in producing fancy perfume, eau de cologne and toilet water. In these products the perfume is solubilized by means of alcohol. It is often necessary to age, chill and filter solutions to remove any insoluble components of the perfume so that sparkling clear finished products are obtained. In some instances essential oil and perfume compounds are rendered more soluble or dispersable by adding emulsifiers such as the polyoxyethylene partial ester types.

Careful selection of the emulsifier enables a marked reduction in the amount of alcohol required for solubilization and in some instances the alcohol might be totally eliminated. Often the solubilizer will act as a "fixative" and enhance the perfume note. By using a small amount of nonionic solubilizer in toilet water preparations less chilling or even no chilling may be required, thus preventing the loss of a portion of the less soluble constituents of the perfume compound. The use of nonionic solubilizers or dispersants would be more universal if it were not for the common practice of the old fashioned "bead test". In this procedure of inspection a rapid shake of the cologne or toilet water produces bubbles which should rise to the surface and immediately break. The nonionic solubilizers are surface tension reducing agents and retard the rate at which the air bubbles break. This "bead test" was probably handed down from the early days of the liquor industry as a means of determining dilution. If the "bead test" were eliminated in evaluating eau de cologne and toilet water, a greater use of nonionic solubilizers would be practiced and a wider use of perfume materials would be possible with no decrease in quality of fragrance.

During emergency conditions when the use of alcohol was restricted, some cologne and toilet waters were compounded in a cream form. Too often problems such as separation and the development of "off odor" brought about by using materials selected in a "crash program" branded many of the products as substitutes. When the national emergency was over, the majority was more than glad to return to the time proven custom of alcoholic perfume solutions.

In general, fragrance or perfume preparations were marketed for their odor value and little thought was

given to other than the appearance and olfactory aspects of the products. Customarily the functional cosmetics were scented so that they would be acceptable to the consumer. In few instances do we find that the appeal to purchase was directed toward both fragrance and function of product. In the marketing of sachet lotions and creams, emphasis was placed on the fragrance with little or no thought of developing a functional cosmetic as the vehicle for an exotic perfume. In fact, it is found that the sachet lotions or creams generally contained excessive perfume percentages, thus restricting application to little more than very small areas. The use of as much as 10 or 12 percent perfume concentration was common. Many of the emulsions contained surface active materials that depressed the perfume note, thus too high a concentration of perfume was necessary in order to "cover" the odor of raw materials.

In producing the highly perfumed cream and lotion sachet, the practice has been to use substantial amounts of the partial esters, such as glyceryl monostearate together with wetting and solubilizing agents, to give the desired degree of stability. The ethoxylated partial esters have also played an important role in emulsion production of this type. The appropriate selection of ethoxylated esters or ethers may also exhibit a fixative effect on the perfume thus brightening rather than subduing the perfume note. However, a less fortunate selection may result in the fragrance note becoming altered or subdued either immediately or after aging. If the perfume compound possesses chemical groups that will interact with the ethoxylated surfactant, an alteration of fragrance characteristics is expected. Rather than approach the problem by eliminating the use of perfume compounds that have chemical groups that cross bond with ethoxylated surfactants, the study has been directed toward reducing the tendency for the ethoxylated surfactant to act as a receptor for reactive groups of the perfume compound. Extensive studies have led to the development of a method of producing ethoxylated surfactants that have little or no tendency to interfere with the perfume. These complex ethoxylated surfactants are extremely consistent in performance and versatile in dispersion of complicated mixtures and solutions such as perfume compounds. The perfume fixative effect of this type nonionic ethoxylated surfactant or emulsifier is unusual and even in non-alcoholic lotion systems only 0.5 percent perfume is required to produce excellent fragrance strength for the preparation.

Formulation Suggestions

A formula illustrating the type of lotion that is operative with most perfume compounds and provides a starting formula suitable for such market potentials as a body lotion, after bath milk or sachet lotion follows:

Sachet Lotion

1. Complex Emulsifier (1)	6.50%
2. Cetyl alcohol N. F.	3.10%
3. Perfume	0.50%
4. Water	44.45%
5. Water	45.45%

Procedure:

A. Heat 1, 2 and 3 to 60°C. in a water bath.
B. Heat 4 to 60°C. and add B to A. Add B slowly at first, stir gently for 5 minutes.
C. Heat 5 to 45°C. and add to A-B emulsion with gentle stirring. Discontinue stirring after 3 to 4 minutes mixing.

This system requires only a minor change in formula to produce a similar emulsion in cream form. The following illustrates this type formulation.

Sachet Cream

1. Complex Emulsifier (1)	7.0— 8.0%
2. Cetyl alcohol N. F.	3.1—10.0%
3. Perfume	0.5— 2.0%
4. Water	45.0—50.0%
5. Water	44.4—30.0%

Procedure:

A. Warm 1, 2 and 3 gently in a water bath to 60°C.
B. Heat 4 to 60°C. and slowly add B to A. Stir gently for 5 minutes.
C. Heat 5 to 45°C. and add to A-B. Mix with gentle stirring. Slowly cool to room temperature. Stirring is discontinued when cream starts to set.

Additives may be incorporated in either the lotion or cream formulas for their specific effect.

If therapeutic effects are desired by the incorporation of medicaments, the preparation would then fall within a drug classification for which certain procedures are required regarding safety and utility before the product may be marketed.

An additive such as Allantoin (2) may be incorporated for its cosmetic effects where its purpose is to counteract skin dryness and to act as a soothing agent.

The simplicity of using an additive such as Allantoin may be illustrated by incorporating 0.2% Allantoin in either the lotion or cream formulas in place of an equal amount of water.

Source of materials

(1) NEOCOL 57-E available from The Dispergent Co., Box 55, Guilford, Connecticut.
(2) Allantoin available from Schuylkill Chemical Co., 2346-2354 Sedgley Avenue, Philadelphia, Pennsylvania.

At the Toilet Goods Association Technical Meeting are: D. Girtz, Cometest, Inc. Eugene Barton of Compagnie Parento, Inc. Mrs. Gertrude M. Sa Vaie, Parento, Harold Suss, Cometest, J. Quigg, Parento (Canada) and H. Accousti, R. H. Macy & Co.

Perfuming of Household Specialties

BY WALTER J. STONE
Felton Chemical Co., Inc.

Technological developments during the last few decades have brought about basic changes in the technique of efficient housekeeping. Consumer demands for improved products as well as vigorous competition among manufacturers for a larger share in the steadily expanding market of household items have resulted in the development of a large number and variety of products. Some of these are strictly functional in concept while others derive their raison d'etre from their purely esthetic effect.

Taking satisfactory performance in their intended application for granted, an appealing fragrance in the finished product must be considered to be one of the most important and deciding factors in consumer acceptance and repeat sales. Singling out for special consideration synthetic detergents for dishwashing we realize immediately the problems involved in selecting the proper perfuming material. These products, while essentially functional, must have their odor in harmony with their use. They must carry the suggestion of cleanliness, freshness, and give support to the anticipation of excellent product-performance. Care must be taken to make certain that odor characteristic is compatible with the thought of food. The perfume must be sufficiently powerful to mask any odor inherent in the detergent itself yet be pleasing and not linger or be noticeable after use. Extreme care and sound judgment must be exercised to make certain that the aforementioned esthetic qualities are rigidly adhered to. The product itself must be extremely stable and not give off any pronounced notes when the container is first opened. It must maintain a sufficiently high odor value so that the last bit of material in the container is as fresh as the initial sampling. Considering the new types of packing materials utilized today, such as cellophane, polyethylene, etc., care must be exercised to make certain that the perfume oils are compatible with the container as well as the product.

In some liquid products the perfume has to be clearly soluble while in powdered products caking must be prevented and the product must remain free flowing at all times. Odor and color stability must be taken into careful account when selecting suitable perfume materials. Such basic raw materials as aldehydes, esters, phenols, and acids are not stable generally in this medium and must be assiduously avoided. Alcohols, ethers, ketones, hydrocarbons and lactones are relatively stable ingredients and will be relied upon heavily to provide the important characteristics of the perfume. Essential oils with high contents of aldehydes, such as Lemongrass Oil (Citral), Cassia Oil (Cinnamic Aldehyde), and Phenols such as Clove Oil (Eugenol), will undergo adverse reactions in the presence of alkali. Amine compounds (Indol, Methyl Anthranilate, etc.) in an alkaline medium in the presence of aldehydes and ketones (citronellal, Heliotropine, Acetophenone, etc.) will cause discoloration, as will phenols (Eugenol, Safrol, etc.) with aldehydes (Vanillin, Heliotropine, etc.) while the corresponding Ethers (Methyl or Benzyl Iso-Eugenol, etc.) are stable under similar conditions. Trace amounts of iron and other metals which might react with the perfume oils to produce off-colors or odor even after a considerable length of time, must be carefully considered and should be inactivated with sequestering agents. Adverse storage conditions such as relatively warm temperatures and long shelf life in inappropriate packing must also be taken into account and properly compensated for.

Let us consider other household products that during the last few decades have shown considerable growth in popularity and sales importance, specifically the room and space deodorants. We have become familiar with these items in various forms in the last several years. They exist today as Aqueous, or Aqueous Alcoholic solutions that evaporate through wicks or other absorbent material such as ceramic blocks, etc. Hand activators for pressurized sprays, disseminators with and without electric fans sometimes utilizing heating elements to intensify and speed up evaporation rate. The idea of improving or controlling odor in an enclosed space goes relatively far back in time. Incense has been used for centuries and

can be considered the forerunner of these streamlined products of our time. The growing need and importance for the control of indoor odors is in direct proportion to our modern living conditions. Opening a window is not always the best or most convenient solution to the problem. Air polution by motor traffic, incinerators, industrial installations which occurs in our modern civilization to say nothing of inclement weather conditions, make the aforementioned solution often impractical. The perfume industry is again called upon to help the harrassed housekeeper to alleviate this troublesome condition. A variety of pleasant, fresh-smelling compounds with citrus, mint, herbaceous, spice, pine, floral and more sophisticated characteristics for various applications are available today. The ever-increasing sales figures prove the definite need and importance of these products. In this connection, mention must also be made of two other household items. Polishes for the care and preservation of wood, metal, glass and leather surfaces in the home and the moth and larvae fighting chemicals such as napthalene and paradichlorobenzine are two outstanding examples. They are extensively used but most unwelcome in their effect on the desirable odor quality of the home. In the case of polishes, the odor problem stems from the use of solvents, waxes and cleaning agents which are necessarily employed in order to make their performance acceptable. Without the help of the perfumer these most useful polishes would carry an austere somewhat resented message of cleanliness and good care. The often utilized strongly alkaline or acidic basic chemicals which are inherent in their formulation represent additional problems to the creative perfume chemists. The pH of the final product must be maintained and the perfuming agent, while being held relatively inexpensive, must not affect the chemical action of the product and at the same time maintain its odor stability under these most trying conditions. Napthalene and para leaves our olfactory nerves begging for mercy, and an effective odor mask which is powerful and extremely long lasting and at the same time blends with these otherwise objectionable odors must be utilized. These practical products, as is often the case, must be effectively camouflaged to receive the wide consumer acceptance they enjoy today.

Many other household items which are normally taken for granted as being unperfumed and are left in their relatively raw state are now being considered for odor appeal. Alert manufacturers have realized that the application of a pleasant odor will provide a desirable new dimension to an otherwise promising product. Now hardly a day goes by without some new heretofore unperfumed product coming through my laboratory for odor improvement. Such commonly used items as paper, fabrics, plastics, insulating materials, etc. all are being considered and thoroughly investigated and remarkably pleasing subtle affects have been achieved which have resulted in additional sales to the enterprising manufacturer. The cost of perfuming household products must be considered a most important investment in the quality of these items and the return for the small cost is brand loyalty expressed in a rising curve on the sales chart.

Perfumes and Plastics

BY DR. T. BASSIRI
Fleuroma, Inc.

As we see the situation, consideration should be given to:

A—the future of perfumes in plastic materials

B—the behavior of plastics when used as containers for essential oils and, among other chemical products, for aromatic raw materials.

In each case the problem is of importance when viewing the progress of plastic materials which are being manufactured by industry on a world-wide scale.

Thus, the perfumer is often consulted on the subject of plastic materials, either to try and overcome an unpleasant odor which, if eliminated, would favor the promotion of an article difficult to sell, or to give to a medium an agreeable odor relating to the nature of an industry under consideration—for example, in artificial flowers.

In this respect, we would like to mention here two typical examples which illustrate the great importance we attach to the collaboration of the perfumer, which is of great benefit to the plastics industry.

1. An important plant in France which manufactures velvet complained of a nauseating odor in the body of the cloth and this was also a source of complaint from its customers. This odor originated in the very particular treatment given the velvet to make it crease-proof and water-proof. The treatment consisted of soaking the cloth in an emulsion with a base of urea-formaldehyde containing silicone. After drying and polymerization at a temperature close to 160°C., which gave the velvet its crease-proof and water-proof qualities, the cloth was put in bolts and stocked in carton boxes. Now when the boxes were opened and even only after 48 hours, a disagreeable surprise was in store, for there was a putrid odor emanating from the material which reduced the saleability of a velvet excellent in quality and of faultless appearance.

It seemed likely that the cause lay in the formation in the fiibres of Methylamine which stemmed from the urea-formaldehyde, the base products, so that after polymerization the penetrating ammoniacal odor was engendered.

Several processes, physical as well as chemical, were resorted to in order to improve and mitigate the disagreeable odor. The task, however, in view of existing conditions, did not seem very easy. On one hand, in considering the state of the emulsion which had a relative and conditioned stability, there could be no use made of insoluble aromatic products, or even soluble ones, which might risk breaking up the balance of the liquid. On the other hand, the drying process and the excessively high temperature of the oven for polymerization destroyed or eliminated totally or partially the odoriferous products used to cover the disagreeable smell.

Finally, we had recourse to processes of aerosolization which are technically available and economical as well, so that it was possible for us to bring about a distinct improvement in the odor which was satisfactory to the customers and put an end to their complaints.

2. This concerns the case of a large factory of artificial flowers also located in France. This firm contacted us when it was still at the beginning of its operations. Its future depended, and the young Director of the firm understood this very well, upon a sure technique in all the phases of manufacture and also upon the quality of the perfume used, the latter playing a not so negligible role.

Our first task was to convince the firm to ignore all doubtful proposals and not to compromise the success of a budding industry because of economic reasons, principally with regard to the perfume. Thus, instead of buying a perfume at $2.00 a lb., they employed products costing $12.00, $16.00 or even $20.00 per lb. In reality, the increase in price was compensated for in large measure by a decrease in the percentage to be used, which we recommended at 0.5 to 1.0 to 1000, in contrast to the proportions used earlier which were ten to twenty times greater.

It did not take long to show results. Larger and larger orders swamped the small factory so that there was practically no possibility of taking care of a continually growing clientele. Today after only about seven years of operation, this small factory grown to the size of an important plant, employs more than 600 workers, has over 100 machines and branches have been opened in other countries. The products of its manufacture are sold everywhere—in the European market, in the Middle East and they even can be seen in the shop windows in New York.

It was undeniably established in this case that perfumery placed a determining role in the success of the operation and it is quite encouraging to see this.

Very often we have noticed that great possibilities exist, the extent of which has not been evaluated, through the collaboration of perfumery which is of benefit to the plastics industry. Numerous items manufactured in plastic material, merchandise which is unsaleable or difficult to sell, would find a better market if they were enhanced by an agreeable odor—this having a psychological influence which is undeniable.

Inversely, the assistance offered by the plastics industry for the benefit of perfumery, has only relative interest. If plastic materials of different kinds can be employed occasionally in the form of boxes, caps and divers accessories, in no case can these materials be used as containers. Many incompatible factors prohibit their use.

Certain types, as in the case of Styrene and the Acrylic Polymers, are soluble in the majority of organic chemical products and as a consequence, are dissolved by the composants of perfumes. Such plastics then could not serve as containers for perfumery materials.

If others, as for example, those made of Polythene and those derived from Polyamides, such as Nylon and Rilsan, have a better resistance to attack by chemical products, particularly the last two, they are not immune, however, from serious changes which condemn their usage.

From experiments made, the following results concern the behavior of Polythene with respect to a certain number of chemical products and essential oils employed in perfumery as raw materials. Alteration and deterioration due to packing in polythene bottles can thus be summed up.

1. Loss of Material[1]

This loss varies according to the nature of the product used. Generally speaking, the loss is important when it concerns the hydrocarbons, the terpenes and esters of not very high molecular weight. When one tries as an experiment, two to three grams in small bottles of 3cc. approximately, the weight loss can be total, that is to say, the bottle becomes empty after a period of four to six months observation. This is the case of Benzene, Toluene, Limonene, the Acetic Esters of Ethyl, Propyl and Butyl Alcohols where the loss is up to 100%.

Under the same conditions, other products in these same categories have suffered losses which are scaled as follows:

P-Cymene	99 %
Bromostyrene	93 %
Styrene	90 %
Terpinolene	72 %
Diphenyl Methane	22 %
Orange Oil	97 %
Lemon	91 %
Nutmeg	87 %
Caraway	73 %
Bergamôt	46 %
Bergamot Terpeneless	20 %
Citronella Ceylan	25 %
Petitgrain Paraguay	15 %
Ylang-Ylang	10 to 15 %
Geranium Africa	10 %
Clove leaves	6.3%
Patchouli	3.3%
Amyl Acetate	91 %
Heptyl Acetate	66 %
Nonyl Acetate	36 %
Geranyl Acetate	22 %
Linalyl Acetate	17 %
Bornyl Acetate	17 %
Amyl Propionate	81 %
Heptyl Propionate	62 %
Octyl Propionate	50 %
Phenyl Tthyl Propionate	14 %
Phenyl Propyl Propionate	6.4%

Methyl Benzoate	64%
Methyl Phenyl Acetate	17%
Ethyl Phenyl Acetate	17%
Butyl Phenyl Acetate	7%

There is no way, therefore, to determine in advance the extent of the loss affecting a product under consideration. It appears, however, as we have already noted, that most hydrocarbons, the majority of

terpenes which are also hydrocarbons and of esters disappear more easily, in comparison with other categories of chemical products.

The percentage of loss which affects a certain number of Aldehydes, Cetones, Alcohols and Phenols which were observed, remains relatively less important.

Aldehyde C8	6 %
Aldehyde C9	5.5%
Methyl Nonyl Acet Aldehyde	3 %
Anisic Aldehyde	5 %
Methyl Hexyl Ketone	97 %
Acetophenone	37 %
Benzophenone	12 %
Phenyl Tthyl Alcohol	15.6%
Geraniol	1.2%
Eugenol	thicken and filter
Iso Eugenol	through the flask

It is interesting to note the parallelism which exists, from the point of view of percentage of loss, between a chemical product and a natural essence rich in this same product.

The essences rich in terpenes: Lemon, Orange and Nutmeg for example, suffer important losses because they include a great mass of hydrocarbons; such oils as Cloves and Geranium respectively rich in Eugenol and various alcohols, show on the contrary less sizeable losses.

Let us add also that the essences rich in terpenes when they lose their terpene constituents, leave at the bottom of the flask a more or less colored residue corresponding to heavy components, waxes and resins which are permeable with difficulty or even are impermeable through polythene.

2. Modification Of Physical Aspect-Polymerization:

If certain products like Benzene, Limonene or Ethyl Acetate evaporate completely from the flask after some time and disappear without leaving any trace, others on the contrary filter through the walls and leave a layer of viscous and gluey matter there.

In this case an increase in weight can be noted, which suggests oxidation followed by polymerization of the product under question. This increase in weight under the conditions mentioned is of the following order:

Vetiver Bourbon	1.1%
Guaiacwood Acetate	1.7%
Vetiverol	3.3%
Benzyl Salicylate	3.6%
Cedryl Acetate	4 %
Coumarin	4.3%
Hydroxycitronellal	6.6%

The flasks show some damage besides—"corrosion" due to attack on the part of the contents.

In rare cases we also have had the opportunity of seeing evidence of coloration. For example, Indole, a powder which is pure white, turns violet after a period of four months from the time it is put in the flask. We are not surprised at this in view of the tendency of this product to oxidate when in organic solution particularly and in aging, which engenders coloration ranging from yellow to vivid red to violet. Unexpectedly though, Coumarin acquired a pale rose color.

3. Odor:

As can be guessed, the odor is not spared either and generally speaking is also subject to a drastic change. The origin of this change is in the different physical and chemical factors which by their action destroy or transform the odor.

The elimination of some part or a great part of the constituents of essential oils by the process of filtration, oxidation, polymerization and as a consequence, resinification; and the contribution of foreign odors—here are the causes working to the detriment of the odor which loses, olfactively speaking, all its interest,

Thus, wouldn't the perfumer, with whose fear and mistrust in olfactive matters one is familiar, reject without hesitation an element which is so actively injurious to the quality of the products, object of so much precaution and solicitude? How can it be thought that such an ordinary "habitat" is the fate of oils so dear to the heart of the perfumer? Technically then, and as matters actually stand, Polythene remains irremediably condemned and rejected as far as its use is concerned for recipients of essential oils and aromatic raw materials used in perfumery.

We know that Nylon and Rilsan, the latter more particularly, offer a better "habitat". From several experiments undertaken with Rilsan, we have not observed the difficulties encountered with Polyethylene. Rilsan behaves incomparably better without letting the contents filter through, or reacting on the olfactory qualities. However, it also shows the grave defect of deformity—the flasks roughly cylindrical in shape, change after some six months to a year and take on an angular quality.

In closing we are willing to admit that the progress made in plastic materials has not ceased to surprise us and that perhaps sooner or later, the specialists on these questions will be able to offer to the perfume industry a material capable of satisfying its needs for bottling and packaging its products.

(1) See "Perfumery & Essential Oil Record"—November 1957 and April 1959

SCC Conferees: Aerosol Industry was well represented at SCC meetings by W. Ralston, Fred Taylor, Fred Presant, J. Russo, J. Frangos, F. Gardner and J. W. Baer.

Some Thoughts On Perfuming of Cosmetics

BY VICTOR DIGIACOMO AND LEONARD STOLLER
Givaudan-Delawanna, Inc.

The perfuming of cosmetics and toiletries is a subject that has engaged both technical and non-technical writers since the earliest periods of recorded history and we have learned much from the scribes that have preceeded us. The subject is, however, a fascinating one and, of far more importance, it is one that continues to develop as time passes and the desires of the consuming public change. We do not expect, in this paper, to present all the intricate problems of perfuming as our title might indicate since such a treatise would be far too lengthy and too involved an undertaking. In the space allotted to us, we hope to briefly sketch the problems that face the perfumer in the task of scenting cosmetic creams and lotions and, in this way, to emphasize the importance of his work.

Before we enter into our discussion, we feel that the importance of the fragrance itself should be stressed. How important is this rather small part, in comparison to the other basic ingredients, to the product as a whole? Experience has proved that the fragrance is the star and the remaining constituents are the supporting cast—the bit players. It is the star that attracts the attention of the consumer—the American woman—and if rejected by her the show—in this case the toiletry—is a flop.

The fragrance has two very important roles to play. First of all, it has a utilitarian function which differs from one cosmetic to another. In this role, it plays the part of a masking agent, covering or neutralizing the unpleasant odors of some of the basic cosmetic ingredients. The second role of the perfume is far more important, in our opinion. It is the esthetic function—the attracting power that makes the cosmetic a thing of elegance—the motivating force that subconsciously moves the woman to prefer one product over another. Without the fragrance a cosmetic is but a mass of lifeless ingredients. It is the perfume that adds the breath of life—the aura—that women seek to enhance their own beauty.

The last and important function of the perfume makes the task of the perfumer even more difficult. This is particularly true of the creams and lotions many of which are used by both sexes. Furthermore, these products are usually used in rather generous quantities and a heavy perfume most certainly would not be suitable. In fact, it might be necessary to lean toward the subtle, possibly dainty fragrances such as the delicate florals.

The whole problem of odor selection must, as of necessity, be coupled to the ingredients of the cosmetic itself. Products containing additives such as bacteriostatic agents, placenta extracts, hormones and others which may have unpleasant odors require a perfume of greater strength than do those containing odorless ingredients. Certain emulsifying agents used today require special consideration since their inherent unpleasant odors must be carefully masked or blended into the scent of the finished product. The perfumer must, at all times, maintain a balance so that his perfume will cover the odors of the raw materials and yet not make the fragrance of the cosmetic too overpowering.

In compounding his perfume, the perfumer must always be aware of the fact that creams and lotions remain on the skin for much longer periods of time than do most other cosmetics. This necessitates careful selection of the perfume ingredients as well as the base materials to avoid those that might tend to cause untoward reactions. Even the slightest tendency toward irritation should immediately eliminate an aromatic from consideration and even after the perfumed cosmetic is completed it should be evaluated for this characteristic to avoid difficulties after sale.

It is equally important that the compatibility of the basic cosmetic ingredients with those of the fragrance blend be determined before the perfume is incorporated. This requires the testing of each individual perfume constituent in the base as well as the

compounded blend. Incompatibilities become immediately evident by a change in the odor characteristics and possibly even a complete breakdown of the perfume composition.

While some cosmetic lotions are sold in colors other than white, the great majority of the creams and lotions marketed today are white. This makes the problem of discoloration an important one for the perfumer to consider. There are aromatic chemicals which, due to instability, will cause discoloration in white cosmetics and even cause changes in color of those that are already tinted. We must also emphasize the fact that chemicals which have proved to be stable can cause discoloration due to the presence in the base of some ingredient with which the chemical reacts. To avoid this, the perfumed cosmetic must be subjected to various oven and ultraviolet tests to determine the stability of all its ingredients.

Although the perfumer cannot dictate concentration and methods of incorporation, he must make recommendations in order to avoid difficulties during manufacturing. The concentration of perfume in creams and lotions may range from 0.25 to 1.0% depending, of course, on the type of product involved, the fragrance selected, the raw materials requiring coverage, and the intended use of the end product. As we mentioned previously, the cosmetic should not be over-perfumed but, on the other hand, the concentration should not be so low as to cause the odor to fade.

When incorporating the perfume into the cosmetic the problem of emulsion stability should be considered. Separation is usually not a problem when solid creams are involved and can be avoided with liquid emulsions. A carefully prepared fragrance developed for a particular end product can be so blended to avoid separation in any phase.

Another factor to be considered during this phase of manufacturing is dispersion. Proper dispersion of the perfume is essential to guarantee that all the contents of the cosmetic package are properly perfumed. Poor dispersion will result in over-perfuming of some of the cosmetic and under-perfuming of the remainder.

The actual method of incorporation depends, of course, on the type of cosmetic involved and differs from one toiletry to another. We have determined that the best method of incorporating a perfume into a cleansing cream involves a continuous stirring of the emulsion while it gradually cools with the addition of the perfume when the mass has reached a temperature of 45°C. It is of vital importance that the perfume not be added when the emulsion is hot. This could cause the loss of the highly volatile odorous ingredients of the perfume blend.

There are some types of cream products which require special consideration by the perfumer. In this category we can place the cream dipilatory. For this product the problem of irritation is of extreme importance especially if, for some reason or other, the depilatory is slow acting. In addition, the active ingredients of hair removers have rather unpleasant odors which require masking and the sulfides used can and often do react with the perfume constituents.

Many existing perfume ingredients are not suitable for the scenting of depilatories, thus limiting somewhat the choice of the perfumers.

We have, up to this point, not discussed the types of odors which are used in the scenting of cosmetic creams and lotions. Actually, there have been a wide variety of scents used for this purpose one of the most popular being the rose. Today the perfumer has not limited himself to this single floral and has created other floral fragrances such as jasmin, honeysuckle, lilac and lily of the valley. Even the heavier Oriental scents are used in creams where the perfume concentration is low. Floral bouquets have also been well received in recent years giving the perfumer even wider latitude than he previously had.

The perfuming of a complete line of cosmetic creams and lotions in which the same odor type is used entails additional research on the part of the perfumer. It is almost impossible to use one perfume formulation in all products of a line due to the different raw materials and the effect they have on the final odor sensation. It is absolutely necessary that the perfumer re-design his formulation to fit the needs of each individual product in the line yet he must keep the single odor characteristic that is desired for all the products.

The various types of packaging in use today are another factor which the perfumer must take into consideration when creating his fragrance blend. The aerosol, for example, brought with it problems which were not experienced before. The perfumer must not only consider the compatibility of base materials with perfume ingredients but also the compatibility of the product and its various constituents with the components of the aerosol container. In addition, he must become involved in the several aspects of corrosion which might be experienced in a pressure package and the compatibility of the product with the propellants or mixtures of propellants that are used.

One of the interesting aerosol products has been the aerosol cream cologne. This fragrance product must be formulated with materials which have the least amount of inherent odor to avoid direct conflict with the rather high concentration of perfume which is normally used. As the following formulation indicates, a concentration of 2% to 4% of perfume is used in a base consisting of triethanolamine stearate soap as well as cetyl alcohol, isopropyl myristate and glycerine.

Aerosol Cologne Foam
(Cream Cologne)

Portion A:

25	Myristic Acid (First Grade)
100	Stearic Acid
10	Cetyl Alcohol Extra N. F. Flakes
25	Deltyl® Extra
100	Glycerine U. S. P.

Portion B:

60	Triethanolamine
1660	Water Distilled
20	Benzyl Alcohol N. F.
2000	

Heat Portions A and B to 70°C. Add Portion B to Portion A when all ingredients are melted and disolved. Stir until cool, and add perfume (2.0 to 4.0%).
Charge with 10% gas mixture:
60% Propellant 114
40% Propellant 12

An aerosol cleansing cream has also been developed differing from the formula type above in that a lesser amount of foaming is necessary. This cream is based on a borax-beeswax emulsion with myristate and stearate soaps to form the proper emulsion. 1% of benzyl alcohol is used to prevent the product from solidifying when it is packaged in the pressurized container. A minimum quantity of water is used and the solvent medium in most cases is equal quantities of mineral oils and isopropyl myristate. This product has one disadvantage which is the lack of sheen that is visible in the conventionally-packaged cream.

Another more recent addition to the family of pressurized products is the aerosol sachet. This product is destined to become widely used because of its multiple application. One important aspect in the preparation of the aerosol sachet is the problem of coloration and discoloration. The product contains perfume oils in concentrations ranging from 0.5 to 3% and because it is applied directly on fabrics, linens, clothing, etc., care must be taken in compounding the perfume to avoid constituents which can cause coloring or discoloring in the fabrics.

Alcohol is used in the aerosol sachet as a carrier and co-solvent for the perfume. It is also possible to obtain a somewhat dry spray by careful selection of the perfume ingredients using those that are soluble in the propellants and reducing or eliminating the alcohol.

The following sachet formulation has been used not only for the purposes mentioned above but also as a personal and room spray depending upon the fragrance type used:

0.5	Perfume Oil
14.5	Alcohol #40 Anhyrous
85.0	Propellants 11 & 12 (50/50 mixture)
100.0	

Although the previous product is utilized as a space spray, its formulation is entirely different from the usual room aerosol spray which contains varying concentrations of the glycols. A typical formula for an aerosol room spray is as follows:

2.0	Triethylene Glycol
2.0	Dipropylene Glycol
.5	Isopropyl Myristate
.5	Perfume Oil
10.0	Alcohol #40 Anhydrous
85.0	Propellant 11 & 12 (50/50 mixture)
100.0	

(Note: the formulas presented in this article are offered primarily to illustrate the subject matter, and not as finished formulations.)

The "Rarer" Essential Oils and Their Use in Perfumery

BY DR. OLIVER L. MARTON
Shulton, Inc.

The term "rarer", used in connection with essential oils, is somewhat arbitrary and needs closer definition. Normally, the word "rarer" could be interpreted as "occurring less frequently", or "only in small quantities", or "not available regularly", or "only from one source", or "from very few ones at best."

It can also be understood as comprising that group of odoriferous raw materials of natural origin resorted to in creative perfume work only in minute fractions of the quantities of the commonly used essential oils, for reasons outlined below.

All these definitions of the term "rarer" or "rare", for a perfume raw material of natural origin, are basically correct. However, in order to justify the classification of an essential oil under the group of "rarer" oils, the reasons for an oil being rare should first be investigated and explained from all existing angles. Before a fragrant oil can be "rare", its odor has to be discovered as existing in a plant or some part of it, it has to be identified by plant origin, it has to be isolated, named, described, produced, its chemical and physical constants established, and then it has to be reproduced to make sure its constants are within certain limits and tolerances. Then only can it be investigated for the purpose of defining its perfumistic usefulness. And if this investigation reveals odor characteristics interesting to the perfumer, then comes the question whether it is worthwhile to further pursue the matter for practical use. Otherwise such a find is destined to go under in the literature of natural perfume oils as a scientific discovery, or a laboratory curiosity, whose only practical destiny is to swell the pages of the coming, revised and enlarged edition printed next. Of course, that, too, has its value—from the scientific view point. However, as creative perfumery finds recognition only in form of harmoniously blended odoriferous masterpieces, the perfumes of a name and reputation, it is most important that the "masterpiece" also finds ready commercial acceptance. And that is just where and why the use of so many of the newly discovered so-called "rare" essential oils find an unsurmountable barrier.

When a new perfume creation is made in this country, it is always hoped that the creation will become a success, will sell by the hundreds of thousands, or millions of bottles. Naturally so, as the United States is of the dimensions of a continent, not merely a country, by its vast distances from Maine to the Gulf of Mexico, from the Atlantic to the Pacific, and its population of better than 180 million. And perfume-using, or perfume-marketing houses are not in business for the sake of the beauty of a creation, they are business establishments selling a perfume creation to make money and pay a dividend to their stockholders.

So, the hope for success of a new creation in the perfume field must of necessity—and ironically so—be coupled with the fear that the item may grow to such an extent that the "rarer" essential oils present in the formula will become unavailable in the quantities required. True, most of the "rarer" essential oils, fortunately, are so powerful in their perfume effect, or so high in price, that they cannot be used in percentages higher than what should be described more correctly as traces only. And that, fortunately

again, is the reason for a number of such "rare" oils to have found regular use in modern perfume creations. Can it not be described as a marvel of scientific-artistic cooperation that products such as jasmin absolute, otto of rose, or rose absolute exist at all, where one drop is the equivalent in odor strength of the scent of thousands of the corresponding flowers, though the fragrance of just one such flower is sufficient to delight the odor receptors in the human nose? Is it not a triumph of perfumery to be so much better than nature itself, in concentrated odor strength? Include in this consideration the terpeneless and sesquiterpeneless oils which are indispensable building blocks for perfume creations in every perfumer's repertoire, such as lemon, orange, mandarin, grapefruit, lime, orris, terpeneless or sesquiterpeneless, with their odor strength and permanency some 10, 30, 40 or 60 times that of their ordinary forefathers, the corresponding natural essential oils, and you have only mentioned some of the most frequently used "rarer" essential oils, not occurring as such, but prepared by human scientific skill to be many times better than nature itself.

And then take the floral absolutes other than jasmin and rose, extracted in different ways, such as Cassie ancienne from Southern France and Egypt, with its intriguing, extremely rich odor destined for high class perfumery; Champaca from Madagascar and Reunion Island, with its alluring, heavy scent, only seldom used now; Gardenia, from California, hopelessly out of fashion for its odor unpopular in perfumery nowadays. Or, the absolute of Geranium, of Southern French origin, ironically enough pushed into the class of the "rarer" (or, better, "more rarely used") oils by practical considerations, as the price for ordinary Geranium oil has gone from $3.00 a lb in the nineteen thirties, to above $20.00 in the fifties. So, none but the highest priced perfume creations can now afford the use of this absolute.

Between the lines the alert reader can see the handwriting on the wall, as it appears with increasing clarity. Absolutes of "rarer" flower oils are fading out in common perfumery, except of course, for the most widely used ones of Jasmin and Rose, and perhaps very few more. The beautiful, eminently rich products of enfleurage of tuberose, jonquille, gardenia and others, as well as the absolutes of such well-known flowers as mimosa, violet or ylang, together with the oils distilled from the abundantly used gums, resins or balsams, such as labdanum, styrax, galbanum, opoponax, etc., have become rarities, in view of the reluctance of modern perfumers to include them in formulas of perfume creations which "threaten" to become big successes in this country. Even the relatively small percentages employed may cause embarrassing demands on the French raw material houses.

Of course, the French, still engaged in the creation and production of expensive perfume extracts more than the perfumers of any other nation in the world, use the bulk of all rare, or rarer, oils produced, as heretofore. Perfumery of other nations, such as ours, still using all those French raw materials available in large, or at least fair, quantities, today is primarily directed towards the creation of medium priced perfume compounds which lend themselves for scenting toiletries or cosmetics of mass production category. For these the use of rare (or even the rarer) oils is small or almost negligible, prohibitive in price, or for reason of unavailability in quantities required. This is a deplorable yet understandable development, partly caused by the expanded use of toiletries and cosmetics over that of perfume extracts and the odor consciousness it brought about in the consuming public. It is deplorable from the artistic standpoint of the creative perfumer, as it must automatically lead to lower standards in this beautiful field of fragrance. The remarkable developments in the field of synthetic aromatic chemicals, the creation of substances approximating the odoriferous principles in the field of animal fixatives, have not nearly been duplicated as yet in the field of natural extracts, simply because the skill, ingenuity, knowledge and experience of chemists and perfumers combined do not suffice as yet to duplicate the superb odor freshness of nature's brilliant masterpieces.

So the use of such rare natural essence absolutes as those of ambrette seeds, carnation, cassie, civet, honeysuckle, immortelle, jonquille, mimosa, narcissus, orange, orris, reseda, tuberose, in addition to previously mentioned ones, goes on in the hands of experienced perfumers, for high class perfume extracts. Many of the now famous, classical perfume creations owe their character, perfection and appeal mainly to the addition of such rarer or rare oils or absolutes. In fact, their use received new impetus only within the past decade by the remarkable perfection of the butane extraction process by one of the best known French perfume raw material houses in Grasse. Its originality lies in the fact that it is carried out without any form of heating and that the solvent (butane gas) can be brought to complete evaporation at normal temperatures. Moreover, the butane extraction goes to work selectively, leaving particles of no odor value behind undissolved. The resulting products, concretes and absolutes, are less colored and of such true odor fidelity that these fragrance marvels can righteously be called the "Hi-Fi" of modern perfumery. Flower extracts which were of little or no odor value, as produced by the older solvent extraction methods, such as lilac, lily of the valley, tilleul and others, suddenly became valuable perfume constituents of natural origin.

The less "rare", less "high priced", more frequently used essential oils, such as basil, calamus, cardamum, carrot seed, cascarilla, celery, cinnamon leaf, clary sage, coriander, cubeb, cumin, cypress, ginger, myrrh, myrtle, neroli, orris, tarragon, verbena are still produced in Southern France, every year, from respectable quantities of flowers or plants, still running into harvests of 50 or 100 tons each, but yielding only from a few hundred to a few thousand pounds of individual oil per year. And some even quantities of less than 100 lbs, as recent statements of French plantation owners bear out. This category probably includes such rarely used oils as angelica, camomile, costus, lovage, melissa, valerian and others.

Wherein lies the secret of prominence of these "miracle oils" in perfumery? Ask the perfumer who

Broom (genet), Spartium junceum L., growing wild north of Grasse. Once a precious perfume flower, now forgotten by the world's perfumers.

has perspired for weeks, months or years to perfect his creation. Only he can tell. When toward the end of his creative endeavor he feels that he is close to his goal, close to perfection in his creation. Yet, his keen fragrance appreciation tells him that there still is something missing, the finishing touch of artistry, the champagne to the gourmet's dinner, the high C to the opera singer's aria, the sparkle to the diamond, the signature to the gentleman's agreement, the conductor's lead to the orchestra's performing, the signature to the master's painting, the micrometer screw to the microscope. This mark of fragrance perfection is often furnished by addition of traces of one or more such rare oils to lift the compound out of ordinary perfection into the class of masterpieces. Of course, considerable skill and superior, artistic scent conception are necessary for the perfumer to make the proper choice, both in odor character and concentration. For the experienced creator this is no miracle. He knows that perfume odor perfection is a direct function of build-up in trace perfumery, that these harmonious blends of trace ingredients,—some yet unknown in structure to man—, are assembled in nature's masterpieces and defy analysis, duplication, or even detection. Small wonder that the creative perfumer resorts to the rare, or rarer essential oils, these master compounds of natural origin, for his finishing touches, rather than to engage in the harmonious build-up of synthetic odor complexes in the micro scale range.

Three times in my life I was stirred, not to say overwhelmed, by flowering odor beauty. As a boy, by the myriads of Jasmin flowers in full bloom in our house's garden in Smyrna, Turkey, when I regretted silently that this beautiful scent could not be captured and preserved beyond the blooming period. Little did I know that time that this was done extensively.

The second time as a chemistry student at the University of Graz, Austria, when I made frequent hikes into the woods, along the Eastern slopes of the Austrian Alps. There, large patches of the delicately pink forest cyclamen, slightly larger than a violet flower, modestly blooming in the shady, mossy, moist forest grounds, revealed odor splendor by their regal scent, to me every bit as regal as the fragrances of jasmin, rose or lily of the valley. And when a little bunch of ten or twenty picked flowers, in a water-filled vase, filled the room with this superb fragrance for two days without let-up, I dreamed that some day this rare scent, sparsely presented to the world by mother nature, would be captured and utilized in perfumery. While the butane extraction process might accomplish this dream now, the picking of the scarcer getting cyclamen flowers has been prohibited meanwhile.

And the third time as a grown-up perfumer, when in summer 1958 I saw millions of flowering broom (genét), growing wild on the stoney slopes North of Grasse, on both sides of the Route Napoleon, bloom and wilt away uncollected and untouched, despised by the world's perfumers of our times. Only some 30 to 40 years ago, more than fifty tons of this flower, Spartium junceum L., were extracted to yield one of the precious raw materials of perfumery of bygone days. Sic transit gloria mundi . . .

Perfume the French Way

BY HENRI ROBERT
Parfums Chanel

An American friend of mine once said to me "Do you know what distinguishes a French perfume from an American one? The French perfume is based on art and tradition whereas the American perfume is based on science and technique."

I do not share this naive opinion which is unfair to both the American and the French perfumers.

I have spent a part of my life in the United States, so I know the American as well as the French methods, and I can compare them.

First of all, I think a good perfume does not pertain to any nationality, and if it is unquestionable that there are many tendencies and varied styles, yet a good perfume will be appreciated everywhere.

If for several decades the French perfumes have been highly valued for their exceptional quality, it is certainly due to the traditions that have been handed down from father to son for several generations of perfumers and which were kept when worth while, but it is due also to the contribution of the latest scientific discoveries wherever they could help the perfumer to improve his technical means and, thence, the quality of his creations.

There is the fact, too, that in France the perfume remains the perfumer's chief aim. This does not mean that the Colognes, Toilet Water or other perfumed preparations are not popular in France. The sales of perfume do not represent the largest part of the French perfumers' sales volume, but a Frenchwoman deems that the right way of using scent for herself is to use the perfume.

It is why the perfumer seeks perfection in the creation as well as in the manufacture of his perfume.

In the States the trend is different, and although the perfume is getting more and more popular due to the Fragrance Foundation, the demand for Cologne, Cologne Stick, Sachets, Sprays, etc. . . ., is so tremendous that the perfumer's activity must perforce be chiefly directed towards the production of such items.

The working conditions of the American perfumer widely differ from the French, and this is due to the big differences existing between the two markets.

On account of the importance of the American market itself, of the intensive advertising carried on, of the number of powerful firms who compete for supremacy on this market; on account, too, of the habits and way of life of the American people, the

perfumery houses must maintain a huge activity and keep on promoting novelties.

Such promotions generally involve big investments for advertising and packaging. That is why the management always tries to obtain the maximum information and security before bringing themselves to making such heavy expenses.

A thorough survey of the market must be made to find out all about the fashion trend and receptiveness of the market. Then, the chief perfumer who has the charge of creating the new perfume or new cologne is informed by the management of the date when the new product should be ready, of its maximum cost, also of the type of fragrance which, at the time, appeals to the clientele for whom it is meant.

It is upon such bases that he will work, and he will submit one or several samples: the fragrance will be adopted after a panel has approved of it.

The French perfumer has to create his perfumes in very different circumstances. The French market is at the same time much smaller and more widely scattered than the American one, and consequently an accurate survey of the French market is not an easy thing. Moreover, as advertising is not so intensive as in the States it cannot exercise so efficacious an influence over the public and incite them to buy a perfume and to renew their purchase. For these reasons, the management rely more upon the perfumer than upon the statistician to determine what type of fragrance ought to be launched, and it lies within the perfumer's job and capacity to have a good knowledge of the market's tendency as well as to create the perfume.

Upon him, therefore, lies a large part of responsibility as regards the launching, responsibility which he shares with the sales management who, on their side, must take all necessary steps to ensure the distribution of the product.

This responsibility, it is true, is not so heavy as it would be in the States, since the French market is less important and the marketing less expensive, at the start at least. It is only when a perfume sells well that the commercial effort is increased. On the other hand, whereas in the States the launching of a new fragrance starts sometimes with a cologne or a Spray cologne, it is more usual in France to put the perfume first on the market, then the cologne, and then again other items of the same line.

Therefore, if we want to study the French technique we must start with the perfume since it will be more complete and more interesting.

A good perfume of the French type must have character, originality, finesse. It must have, too, diffusion, strength and tenacity. All these qualities will be obtained through a perfectly balanced blending and the use of raw materials carefully selected from the most valuable, not because of their cost but on account of their olfactory value.

The creation of such perfumes requires much time and the perfumer could not meet the management's demand in so short a time as allowed him to work out a new perfume but for the fact that he has always prepared in advance many combinations or rough formulas, and he will be able to pick up amongst them some interesting elements to build up his perfume.

Consequently, the perfumer must be acquainted with all artistic creations, he must be constantly familiar with the clientele's tendency so that his creations be in harmony with the taste of the time and of the market where the perfume will be offered.

But he must also examine carefully all new raw materials, simple elements or compounded bases, because some of them may, by their new note, bring new ideas likely to stimulate his imagination and lead him to new combinations, or merely to help him improve his manufacture. Every idea about a new perfume, every new combination will immediately be put in formulas, tried in his laboratory and worked on as much as possible.

In due course, that is to say when he is requested to create a perfume, he will only have to choose, amongst those basic foundations, the ones that by the character, their originality, answer best to the required type of perfume, and starting from these bases he will build the definitive formula.

Since these bases are made of a few raw materials only, which evaporating power and olfactory strength vary, the balance of the composition changes quickly and, sometimes, it may deteriorate in a few minutes. The perfumer will have to emphasize the tonality of the perfume, to reinforce it with a solid background, to enrich its formula with finer raw materials and finally, to give to his perfume a lasting quality that so many people require.

The physical or olfactory fixatives which were so much spoken of are really of very little help to the perfumer. The physical fixatives delay the evaporation of the perfume, but very often by diminishing its strength. The olfactory fixatives are supposed to enhance the fragrance but they often destroy the balance by substituting their own fragrance to that of the perfume.

The fixation is actually done by enriching the foundation, giving volume to the body and making its fragrance more lasting. Care must also be taken not to flatten it.

Like in the art of painting, where it is through the effects of the complementary colors that the predominant one is strengthened, it is through the contrast of the opposite odors that the basic fragrance will be given its full value.

Like in a picture again, or in a symphony, the background must sustain the chief theme and set it off. The ratio of the various volumes or groups of odors, the opposition of their values or strength will have to be combined in harmonious proportion so that their compounding presents a steady structure which, nevertheless, will appear to be very simple, very clear.

Whereas more or less definite law exist as concerns music, or painting, or other arts, nothing of this kind has ever been expressed for perfumery. It is certain, however, that in the combination of the various elements, general rules of Aesthetics can be applied with profit. To facilitate changes in the combination of the various olfactory elements the classification of the fragrances by groups may be very helpful. In fact, many perfumers are presently using such a

classification and their work has thus been greatly facilitated and quickened.

A selection of the raw materials usel in the perfume is indispensable because the finesse of the perfume will depend upon the quality of its components. It is necessary, too, to make sure that the raw materials used are always available because the non-availability of one or the other raw material may imperil the manufacture of the perfume, and this may mean a great loss of money if the perfume is successful.

Once the perfume has been created and adopted, the manufacture of it will have to be supervised by a very able olfactory expert. The quality control of the raw materials and of the products in course of manufacture will have to be done most carefully. Whether he be using or not physical and chemical methods to check the quality the perfumer must be able to appreciate through his sense of smelling the quality of the raw materials because, in any case, the olfactory estimation shall be preferred to the results obtained by physical and chemical analysis.

The alcohol that forms the support of the perfume will have to be selected with the greatest care, and I must add that in many instances the alcohol used not being of a sufficiently good grade, the perfumes are very bad notwithstanding the very good quality of the concentrate used to make them.

The raw materials not only have to be perfectly selected, but also to be used at their best. In fact, some of them must be very fresh, and the ones that are gathered in, once a year only, must be stored in the best conditions, that is to say in a room with a temperature maintained between 10° and 15°C, said temperature being kept as steady as possible. The products will be kept in containers of very neutral glass or of any other neutral substance, well stopped and sheltered from light.

Some other raw materials must be used only after several months' aging (patchouli, vetyver, tinctures of musk, of ambergris, etc. . . .). For the tinctures, aging may even be of several years. Many processes to obtain faster aging have been recommended but I must say that, personally, I have never found any that gave good results. Some are efficacious but, unfortunately, they do not improve the perfume, and consequently cannot offer any interest.

The aging of the finished perfume has been often discussed: some maintain that it is useful to have the perfume or the cologne macerate for several months. In truth, such cases are very rare. One or two weeks' maceration are sufficient as a rule, and over a month's maceration is rather unusual.

Filtration takes place after maceration. As to chilling same is useful only to avoid the liquid getting cloudy through cold. If the climate does not necessitate chilling it is better to be satisfied with a good filtration.

All this sounds very simple. In fact, the perfect quality of the perfect perfume depends on the perfection of the formula and the way every detail is accomplished during the manufacture of the perfume.

This is the way the good French perfumer works. I don't see any difference in the way a good American perfumer should work.

Pharmacological properties of some essential oils

BY JOVAN TUCAKOV
Chairman of Pharmacognosy
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It has been known for centuries that essential oils have an efficatious microbicidal power in the disinfection of wounds.

The most remarkable are the unguents based on garlic, onion and other types of the *Allium genus* containing sulphur heterozides and other sulphur compounds which on hydrolysis give the essential oil of garlic. The latter has a considerable antibiotic power. The study of this essential oil was taken up again, and its bacteriocidal power verified in Jugoslavia and other countries, especially after the discovery of penicillin and other antibiotics. Among the *phytoncides*—the name given by *Tokin* (Tomsk) for antibiotic substances obtained from superior plants—the essential oil of garlic is the most interesting. The experimental study of this essential oil, which has a penetrating, irritating and disagreeable odor, has shown itself—these last years—to belong to the group of excito-stupefiers. It is eliminated by the lungs, more slowly in the case of hepatic and pulmonary insufficiency. The action of garlic essential oil is admitted in diverse pulmonary affections (Tuberculosis, whooping cough, gangrene). It is an appreciated vermifuge, against round worms for children. Numerous medical preparations which have a hypotensive and vasodilatory action contain among other things garlic essential oil. After the absorption of minimal doses of garlic essential oil, a persistant hypotension is obtained which still is found on the next day. The oscillometric index takes on a double, triple and quadruple value of the initial index.

With garlic essential oil *Wasicky* was able to arrest the development of *Bacillus Proteus* at a dilution of 1/50,000, whereas for phenol one must have for same results 1/400.

The experimental results with garlic and its essential oil are most interesting. They are a part of the Greek pharmacohistory and other ancient classics as well as of popular medicine because of its revulsive, antiseptic, antispasmodic and anthelminthic properties. In the popular medicine of Jugoslavia garlic (and its essential oil) is a panacea i.e. universal, preventative and curative, especially in epidemic cases of gastro-intestinal and pulmonary passages.

The essential oil possesses a strong irritating action on the skin and especially on the mucous membranes. In a therapeutic dose it is a rubefacient, and when a strong dose is given it is a vesicant and even provokes deep ulcerations.

It also has a stimulating action on the scalp.

The essential oil of *black mustard, horse-radish* and the other sulphurous essential oils possess up to a certain point properties similar to pharmacodynamic ones.

Among the essential oils having a *sedative and antispastic* action can be named those of *valerian, hops, asafoetida, garlic, castor, musk and some others.* All these odorous materials, especially valerian essential oil, exert a depressive action—feeble but clear—on the centres of the cortex and subthalmics. It must be noted that this depressive action of valerian is sufficiently powerful to be antagonistic to the stimulating affects of caffeine.

It is uncontestable that opium and especially its principle alkaloid, morphine, then a whole arsenal extremely rich in synthetic organic medicaments, and equally so in mineral salts, exert a hypnotic and sedative action which is much more pronounced and allows the organism to attain a state of sleep. It also acts against various conditions of agitation (psychic) or convulsive crises, but the greater number of these medicaments are more or less toxic and certain among them provoke illnesses much more grave: opiumism, morphinism etc.

The essential oils of various types of *mint, melissa, basilic, chamomile, lavender, caraway, fennel* and above all *matricaria* (*Matricaria chamomilla*) exert an antispasmodic action in diverse organs rich in smooth muscle fibres: vessels, bronchs, digestive tubes.

Camphor is the stearopten of some essential oils. It exerts, in small or middling doses, an action which stimulates the central nervous system.

When strong doses are given, after the stimulation follows paralysis. The therapeutic use of camphor essential oils (especially pure camphor) are not only limited for use as a stimulating reagent on the encephalon but it is also used, and that quite a lot and more often, for the reanimation of the heart. It is one of the best cardiac analeptics. The essential oils of camphor are excellent encephalitic stimulants, and excite the respiration.

It is indisputable that in the pharmacodynamic

groups *"modifiers of nutrition" and "exonerative medicament of the digestive tube and its annexes"* the aromatic plants with their essential oils occupy one of the first places. The tens of essential oils, especially the *umbelliferous and labiates* are appetite stimulants or of digestive secretions. They are a sort of nutritive medical aromatic analeptic, therefore indirect tonics and roborants. The essential oils of *pepper, ginger, galanga, zedoary, piper, chamomile (Anthemis nobilis), mint, melissa, laurel, anise, persil, dill, garlic, origan, mustard* and others stimulate digestion. In these stomachic medicaments we have at the same time the spices and condiments the most appreciated and most used in the kitchens throughout the ages among all peoples.

Certain essential oils of the compositae and labiatae (*achillea, absinth, lavender, rosemary, mint . . . .*) exert a *choleretic action*, direct and indirect, by augmenting the billiary secretions.

As an *antivomit* medicament the essential oil of *melissa, citron, bergamot* and others (having an agreeable and refreshing odor) are used in Europe. These essential oils prove themselves to be capable of inhibiting the action of vomiting by reacting on the different points of the vomiting reflex.

As a modifier of the respiratory rhythm and of the cough one must take note of the essential oils of thyme and wild thyme. The active principle here is the thymol (a phenol), and carvacrol respectively.

Among the medicaments for drying the mucous of the respiratory tract we must mention the coniferous essential oils, especially turpentine (terebinthines) of diverse pines. The *terpens* are the principle activators.

The essential oil of the *thyme, wild thyme, origan, basilic* (all containing *thymol*), *chenopodium* (*ascaridol*), *absinth, thuja, tanacetum* (all containing *ketone thujone*), *garlic* and other aromatic plants are esteemed vermifuges.

The thymol essential oils, *eugenol, anethol and other phenols*, esters and other compounds possessing antiseptic, balsamic and diuretic power, owing to their property of being eliminated by the respiratory and urinary channels.

The emmenagogue and abortive properties of the essential oils of *ruta, sabina, tanacetum* and other plants are known.

The essential oils which contain the principle ketonics, i.e. *thujone* (essential oils of *absinth, tanacetum, sage*) are poisons which cause convulsions and epileptic-like attacks.

Lastly one must not neglect the *esthetic, suggestive* and *psychotherapeutic* moments provoked in patients by medicaments having an agreeable odor and taste.

Before closing this short discourse which I have been permitted to give to the readers of *"American Perfumer and Aromatics"* on the recent use of an essential oil of great interest for world therapeuts, I must mention the essential oil of *matricaria* distilled in Jugoslavia from the flower-heads of *Matricaria chamomilla L*, ". . . . *Bing* showed that the essential oil of *matricaria* produced an *antispasmodic, anesthetic and even disinfectant effect. Its ingestion triples the number of leucocytes, favors digestion, eliminates the secretions and purulent inflammations of mucous membranes, is particularly used against constipation or accumulation of feces, especially of the left colon.* The infusion of dilute essential oil 0.80-0.50% has the properties of an *anti-inflammatory* owing to its *azulene* content . . . . The lotions exert a favourable action on the scalp: hair becomes supple, shiny under the influence of mucilage contained in the plant, of the essential oil and of the acidity of extract. ". . . . The matricaria has a very great therapeutic use in the form of infusion of fluid extract and that of diverse pharmaceutic specialities . . . . Treated with success are skin inflammations and those of mucous membranes, wounds, boils, burns, for inspirating, gargarisms etc.". (*Jaretzky*)

". . . . The influence of certain azulenes on the evolution of inflammatory reactions suggested an explanatory theory of which *Jancso* appears to take the merit . . . .: Histamine is a physiological activator of the reticulo-endothelial system; he admits that the *azulenes are capable of stimulating histaminogenesis and to maintain it at a level sufficient to assure beneficial activity of reticulo-endothelial system outside of all allergic action.* It seems that the azulenes could, to a certain extent, compensate for the effects of a hyperhistaminogenesis. Clinically the azulenes very often behave like valuable medicaments in a series of troubles which can come from either a hyperliberation of histamine or, on the contrary, from an insufficiency of the reticulo-endothelial activity. Numerous tests have shown that the antiphlogistic action of azulenes is very real (*Caujolle, Boisset*)".

The *chamazulene and guaizulene* have antifloguistic, antiallergic properties and favour repair of tissue. Toxicity is very weak (DL=lg/Kg; *Caujolle et al.*), more so as the therapeutic doses are minimal . . . . (*Thomas*).

The azulenes extracted from the essential oils of plants, such as *Matricaria chamomilla, Anthemis nobilis or Achillea millefolium* have the properties of *stimulators, of producing histamine in tissues, of being agents of defence of organism and of repairing tissues. The chamazulene which is not toxic has an antiallergic action, the mechanism of which differs greatly from that of the antihistamines and of cortizone.* (*Bajus*).

The epochal discovery of antibiotics in inferior plants cut down for a certain time the interest in the study of essential oils. Meanwhile, within these last years, the interest has revived in *aromatherapy.* The "First International Congress of Essential Oils" at Reggio Calabria in March 1956 and the 2nd in July 1959 at Grasse, the importance of aromatherapy was pointed out.

"The health and eternal fight for health". The number of medicaments increase from year to year and our medical material is enriched more rapidly. In spite of the great progress in medicine and in biology in general, we often ignore the intimate action of many medicaments. This is the case especially with essential oils, since they are products of very complex and varied compounds. It is thus that in certain moments of discouragement one finds out that the more one studies the more one realizes ones ignorance, the more one teaches, one perceives ones insufficiency.

History of Perfumes

BY H. GRIBOU
Dragoco, Inc.

Inscrutable darkness envelops pre-historic times. The light of science has not succeeded in penetrating the mysteries surrounding the earliest human inhabitants of our earth. We do not have definite knowledge as to what senses or sensory powers were the endowment of pre-historic man. However, there is reason to believe that, genetically, the sense of smell may be the oldest of all human senses. Early primitive man "followed his nose", an expression we still use today. It was the sense of smell, and not sight, which was predominant at a time when wisdom was nose-wisdom. We do have some direct proofs of this thesis: that the most primary of all senses is the sense of smell, buried deep in the human unconscious. Engravings from La Marche near Lussac-les-Chateaux provide such evidence. Most of the human faces depicted are concealed under masks and probably served purposes of magic; only a very few depict the face as freely as the human being of that age himself saw it. What is striking in many of these pictures is the prominence of the lower parts of the face and, in most cases, a very protuberant and extraordinarily pronounced smelling organ. Modern science supports the belief that the average human of the prehistoric era had a comparatively large or long nose, and Albert Wesselski, a former professor of the University of Prague, holds the view that "there existed large-nosed ancestors of man, furnished with more elaborate olfactory nerves than we have."

Attached to this uncommonly pronounced sense of smell is a special practical importance. Smells and fumes were used to help in hunting and in hunt-magic. For without hunting, the old Stone Age men could not have kept alive. Agriculture and cattle-raising were as yet unknown at that time. All means, including magic conjuring rites, had to be used for getting ample prey from gods or demons.

In old hunting manuals, one can read of various odors which are supposed to attract game. They were buried in the tracks of the animal. For such purposes, odors repulsive to man were employed such as urine, old fish, lavage, or hazel and birch sap, hart-root, camphor and rock salt. Humans of the so-called primitive world of today, the "unenlightened" natives, still possess an uncommonly pronounced sense of smell. The love poetry of primitives is full of references to the sweet-smelling beloved. Enamored natives in the Philippines present each other with pieces of their linen, saturated with their body odors. The Karyaks, an old primitive Siberian race numbering about 7,000 at present, do not even have a word for "love", saying instead "to smell." This is similar to the Tibetans who, rather than kissing, rub noses in order to form an intimate acquaintance.

Fragrance Pleasing to the Gods

Corresponding to the highly developed and predominant sense of smell in the primitive world was

the so-called magic stage, when mankind did not think intellectually in terms of causes but rather emotionally in terms of images and symbols. This epoch in the history of man lasted until the rise of religious systems in the late Stone Age, about 3000 B.C. In these early stages of culture, there are no perfumes for private use. Fragrance is reserved for magic sacramental purposes only. The burning of incense is a part of the craft of the medicine man, magician or shaman. In the religious era (which is connected with the magic one), scents are a way of divining or approaching the gods. "God is fragrance". Thanks to incense and scents, connection with the divine powers is established by winning their favor, for they, after all, are themselves fragrance. Pleasant smelling incense conjures up benevolent spirits, bad smelling incense, the evil ones (demons). Many peoples believed that fragrant flowers and essences are an annoyance to the evil demons. Evil turns away from the pleasant smell, whereas a stink attracts what is diabolical.

A survey of all the facts taken from early history leads to the conclusion that the sense of smell played a highly prominent role: smell is virtually the key to the door of the magic world.

The Babylonians and the Assyrians

In the great Bel Temple at Babylon, the capitol of the realm under Hammurabi (about 1700 B.C.), a yearly supply of 1,000 talents or some 60,000 pounds of incense was required. The scent cult governed the lives of men in early antiquity. The religious use of incense was common to the Babylonians, to the Assyrians and the Persians. Five times a day, it was burned on the altars by the priests. Large amounts of aromatic resins and woods were consumed in Babylonian temples in honor of the deities. Investigation has turned up evidence that, as early as 2100 B.C., the ancient Babylonians created and used outstanding chemical preparations for the preservation of dead bodies, i.e. mummification. The dead were anointed with highly scented essences, and jars of perfumed oils accompanied them to the grave. About 1700 B.C., the contents of Hammurabi's wise laws leads to the conclusion that the use of numerous medicines and vegetable odorants was widespread. Perfumes and fragrant skin-oils are used as a matter of course in the care of health.

Great quantities of scents were consumed for private uses. People bathed in precious perfumes, and at banquets, continuously burning vessels spread fragrances. The Babylonian king, Nebuchadnezzar II (605-562 B.C.), had built magnificent terraced gardens, the hanging gardens of Semiramis, one of the seven wonders of the ancient world. Here grew cypresses, mimosa, roses and lilies, in whose fragrances there was much pleasure.

The Persians, who captured Babylon in 539 B.C. and annexed the kingdom, passed on to the Greeks —and thus later to the Romans and the Occident— the knowledge and use of scents and of beauty agents that they had gained during their military expeditions. They had learned about perfumes and cosmetics from the experienced Medes, and this knowledge too was passed on to the Occidental world. The Phoenicians as far back as 900 B.C. carried on extensive trade as wholesale producers of cosmetics, medical drugs and chemical preparations. They exported their goods which were in great demand as far as Scandinavia.

Greeks, Gods and Perfumes

According to the Greeks, perfume is of divine origin; how could it be otherwise? Vapors of ambrosia go together with the manifestation of the deities; nectar and ambrosia are their food. According to the hymns of Orpheus, certain perfumes sometimes symbolized gods and heroes. "God is perfume" applied here too. According to an old tradition, Helios, the Sun God (Apollo) was represented by heliotrope scent. Aphrodite, the goddess of Love was compared with myrrh; the goddess of the hunt and mistress of wild animals with vervain, and the Nereids, those garrulous sea goddesses, with rosemary, while the beautiful prince, Adonis, who fell in love with Aphrodite, was symbolized by the anemone.

By 700 B.C., the priests of the Temple of Aesculapius, the Greek god of healing, were known as the gatherers and preservers of medical knowledge. This applied not only to surgical experience, but also to preparation of herbal infusions, healing salves, skin-oils, aromatic essences and cosmetics. The recipes for the preparation of perfumes were inscribed on plates of marble which were exposed in the temples of the Love goddess, Aphrodite, and the god of healing, Aesculapius. In olden times, priestesses handed over the knowledge of perfume manufacture—proof of value and sanctity the Greeks attached to aromatics.

Under the influence of Asian peoples, other essences were produced. Theophrastus (372-287 B.C.) mentions that many perfumes were prepared from flowers, others from stems and leaves, and some from roots. In "Natural History of the Plants", Theophrastus describes about 5,000 varieties, among them, healing, dyeing and scented plants which could be used for medicinal, chemical and cosmetic purposes. The traveller, Pausanias, reports (app. 175 B.C.): "Here in Chaeronea, unguents were prepared from flowers, from the lily, the rose, the narcissus and the orris. These are made as a sedative for human pains."

Already in antiquity, the Greeks were aware of the relationship between smell and sexuality. For example, the "rhypos" cosmetic was quite unique. It was obtained from olive oil, wrestlers' sweat and mud. When the athletes, engaged in heated contest, had rubbed off their perspiration on the walls, the "alipts" (the wrestlers' ointment-appliers and trainers) collected it or scraped it off the walls, mixed it with a little oil, and sold it to the ladies at a high price. Perfume was used for private profane purposes as well as on sacred and festive occasions. Everyone used perfume and incense, rich and poor alike, to all imaginable purposes: for worship, as gifts, for the body, the bath, furniture, clothing and for drinks. Each part of the body was besprinkled with a different sort of perfume. Antiphanes tells us: the feet and thighs with Egyptian salve, chin and breast, with palm oil, the arms with peppermint, the eyebrows and hair with marjoram pomade, the knees and neck with thyme. Perfume was frequently rubbed

into the skin as it was thought that the brain would be refreshed by the fragrance and kept healthy.

The Ancient Hebrews: Experts of Sacred Oil

The ancient Hebrews were a religious people. Their lives were devoted to their powerful, wrathful and loving God to whom the burning of incense was an honor. Israelite altars for burnt offerings have been identified back as far as the 8th or 10th century B.C. "The incense of aromatics" was considered extremely sacred. Imitation of it was absolutely forbidden under threat of great punishment. Among other things, it consisted of sakti, galbanum and pure incense. The burnt offerings used in religious cults were supplied by myrrh, ambergris, sandalwood, benzoin and labdanum. Some scent-giving plants such as myrrh were also used for hygienic purposes such as masticants for care of the mouth. Incense, holy anointing oil and spices represented treasure. When the Queen of Sheba paid Solomon a visit, she brought such spices with her as had never been seen before.

In the culture of scents, the Hebrews were the pupils of the Egyptians. The use of scents spread among them only after their return from captivity. At the beginning, they made far less use of fragrances than did their prodigal teachers. They were lavish only in their use of ointments. They made tallow, wax and fatty oils fragrant with ambergris, cinnamon or benzoin. The balm of Gilead, from the countryside of East Jordan that extended from present-day Ajlun to Beika, became famous.

It remained for a later time to make profane use of perfumes and scents.

Scents, Spices and Alchemy

Early in the first century A.D., the cosmetics industry of wealthy Rome was producing more than 600 pastes, paints, hair-dyes, skin-creams and fragrant oils. Perfumes were in great demand. The word "perfume" itself derived from the Latin "per fumum", i.e. by smoke. The aromatic odorants were originally burnt over an open flame, thus giving off a strong perfume. Choice varieties of wines were aromatized by the addition of rose petals and a number of condiments. These were the forerunners of today's scented lotions. It was not until 900 A.D. that Arab chemists discovered pure alcohol while distilling wine. Alcohol became indispensable thenceforth to the chemicals and cosmetics industries. When men learned how to obtain alcohol, the "spirit of wine" in concentrated form, the use of aqua mirabilis, "miracle waters", became common. Scented lotions were prepared with the addition of rosemary, melissa, lavender, cloves, lemon peels, cinnamon, etc. By 1000 A.D., German terms began to appear in the herbals side by side with Latin technical terms and plant names. Wide strata of the population were now in a position to find for themselves the plants, etc. which they require for beauty culture.

The Progress of Perfumes Over the Centuries

Alchemy, chemistry, widening areas of trade and conquest—all these contributed to the development of modern perfumery as we know it today. Its full development did not occur, however, until the evolution of the aromatics industry. This began around the seventies and eighties of the last century in close association with the chemical investigation into the individual constituents of essential oils. Vast improvements in the quality of essential oils followed these developments and, at the same time, new chemical processes made it possible either to isolate fragrance principles or to manufacture them synthetically. Investigators such as the chemist, Gustav Haensel, succeeded in obtaining oils free from terpenes and sesquiterpenes; it was then possible to separate the not very soluble and weak-smelling terpenes and sesquiterpenes from the ingredients of the essential oils with a high odor value. New standardized fragrance principles were being constantly developed, and the perfumer now had at his disposal not only purer, improved and more highly concentrated essential oils, but the number of elementary substances themselves were increased by a considerable quantity of chemically standardized bodies of the most varied kinds.

The refinement which took place in all branches of natural and artificial perfume materials made itself felt in the subtlety of finished perfume products. The period when perfumers ingenuously mixed one essential oil with another disappeared forever. The emergence of La Haute Couture on the stage of the classic perfumers has created a new spirit in perfumery. This new direction, perfumes created by the big perfumers and presented by the big couturiers, is an expression of our time and style of living. Has it not always been the aim of the perfumers to include the spirit of the times into this sensuously perceptible sphere as an expression of all that is personal?

Some Newer Synthetic Chemicals

BY JAMES HACKFORTH-JONES
Yardley & Co., Ltd.

The search for new chemical bodies possessing interesting odour characteristics has been pursued sporadically for many years. Most Research Chemists, particularly at the undergraduate stage, have speculated about the kinds of odour one would get from chemicals of odd configuration. Young Chemists are always looking for excuses to make new chemical bodies for, at least in England, it is not considered quite the thing to carry out syntheses without some reason. Thus in the more unscientific past a description of odour appeared whenever a new synthesis was claimed—the amateur Chemist had spent months getting his few grains of material and having once described it—melting point, crystallographic form, colour, he was certainly going to try taste and smell.

The odd thing is that practically everything of any value has been discovered in this way.

Nowadays, when amateur science has been all but completely swept away, there has to be a reason, theoretical or commercial, for carrying out research. In the odour field there are three reasons, but ultimately they boil down to the same thing. Reason number one is that there is a constant demand for new fragrances and one way to get them is through the use of material not available in nature. Reason number two is that nature seems a little stingy with some of her more appreciated produce—Otto of Rose, Musk, Geranium, Bergamot—and we would like to know what special substances make these oils so good and synthesise them.

Reason number three is that the scale of the industry has increased so much that there are not enough oils to go around; there is a requirement to match nature in order to obtain material at constant cost irrespective of the rate of consumption.

I have said that on analysis these three points amount to the same thing. I would like to comment on this.

Point three is another way of looking at point two, since unless one can find the key substances it is impossible to duplicate the natural oils.

Point one seems to call for work quite the opposite of that demanded by point two. But it is often forgotten that *no one*, perfumer or public, will use a product he does not like. Taking the world as a whole there must be at least 12,000 new chemicals awaiting evaluation. New, original, unknown in nature, and unattractive *because* they are unknown in nature. We know what we like. We like what we know. The 12,000 chemicals may remain forever a monument to the systematic approach to research in new odours.

This is not to say that new chemicals cannot be found if one goes the right way about it. There is only one way, and that is by comparison with nature. If the oil does not recall something already existing in nature it had usually best be forgotten.

This is my justification for classifying new and original odours under familiar natural headings. Starting, as it were, at the top, we have:

Citrous, Lavanderaceous, etc.

A great deal of progress has been made toward the analysis of Citrous oils, and some important new bodies are available. But it turns out that the terpene fraction is all important, and until this can be broken down we shall not know what gives for example Lemon and Bergamot their characteristic 'lift'.

Citral

Citral has come under very close scrutiny and is now available synthetically in high purity. For reproduction of the character of some of the natural Citrous oils pure Citral represents an important advance. The ratio between the isomers (Geranial and Neral) has been much discussed recently. In nature these occur together in the proportion of about 60% Geranial to 40% Neral. It is accepted that all Citral has the Isopropylidene structure. This leaves unresolved the possibility that Citrals of Isopropenal structure might eventually be synthesised and perhaps prove to possess odours of exceptional interest.

Lemon Citranova Fine—X

This entirely synthetic material is a remarkably good reproduction of natural Terpeneless Lemon Oil.

Citral Dimethyl Acetal

Citral Dimethyl Acetal is useful on account of its stability in conditions which destroy the parent body.

Nerone

Nerone is an important new material with an odour recalling in some respects that of Petitgrain.

Ethyl Linalol, Ethyl Linalyl Acetate

Unknown in nature, these materials are of great value when creating Citrous bases. They can be blended very readily with

Linalol, Linalyl Acetate

Synthetically prepared, these materials must be rated as new chemicals. Pure Linalol has a most beautifully pure and flowery odour which lifts it far above anything previously available in this field.

Citropal

This is very helpful in producing fine quality Citrous effects.

Menthanyl Acetate, Nopyl Acetate

These are, in some respects, reminiscent of Petitgrain and Bergamot. They give quite good results when used in very large proportions.

Isobutyl Heptanone

Used in modest proportions is helpful in obtaining a natural effect.

What is lacking as yet in the field of Citrous and Lavender notes is an adequate study of:-

a) The trace materials present in minute proportions in the top note—probably nearly all Ketones.

b) The so-called inodorous terpene fraction.

At times research has learned too heavily on (a) at the expense of (b): but so much effort is now being concentrated on this problem that important advances are bound to come in both fields fairly soon.

Rose Notes

This, one of the most interesting fields of perfumery, has seen its most important advances as much in the manner of production as in the new bodies which are produced. The Glidden process for the production of aromatics from turpentine has made available at very low cost 'Geraniol', 'Citronellol' and, of particular importance, 'Nerol'. These descriptions naturally leave a great deal to be desired so far as scientific accuracy is concerned. But then, until the introduction of VPC (Vapour Phase Chromatography) it is doubtful whether any of these materials had been examined in the pure state. Glidden do not claim to offer 100% pure isomers, but it is noteworthy that the Nerol, at 80% purity, contains a higher proportion of this substance than any previously on the market.

While on this subject it is of interest to note that the body known to Chemists as Rhodinol (or alpha Citronellol):-
which, it is supposed, almost certainly does not exist in nature, has now been synthesised on a laboratory scale. It proves to have an interesting full note, capable in small proportions of enhancing the odour of pure dl beta Citronellol, which suggests that the analysts may have been hasty in denying its existence.

There are also some important new rosy or green rosy bodies which have little to do with nature:

Vertifol

Interesting odour of great strength.

Phenyl Ethyl Thiocyanate

Possessing a subtle Rose character.

Roselium

Material of fundamental importance possessing a wide range of application.

Folrosia

Deep Red Rose with Green nuances.

Lily—Lilac

Here again one must begin by mentioning Hydroxy Citronellal and Linalol produced by the Glidden process. The Hydroxy has a soft bland odour which will find important application.

In the new field there are:-

Lilial

Methyl derivative of Cyclamen Aldehyde. Slightly different tonality, but will do everything Cyclamen Aldehyde will do, with none of the limitations.

Hydroxy Citronellal Dimethyl Acetal

More stable than Hydroxy, especially in soap.

Cyclamen Aldeyhde Di-Methyl Acetal

Another material which overcomes the instability of Cyclamen Aldehyde.

Primacetal

A derivative of Phenyl Acetaldehyde possessing a very interesting odour.

Mugoflor

Extremely stable Lily odour.

Ionones

The analysts tell us that we have to consider no less than six isomers of Methyl Ionone and a still greater number of Irones. In the case of Methyl Ionone there is no doubt that combinations of isomers exhibit odours which are more pleasing than those of the individual isomers taken alone. Add to this the contribution of trace impurities which are inevitably present in commercial products and the problem of relating odour to nomenclature becomes excessively difficult. Lastly the Methyl Ionones pick up Oxygen very readily and this too modifies the odour. My suggestion is that a would-be purchaser should disregard completely the chemical description and select simply the odour which gives the best result.

Irone

Purists may object to my classifying Irones with Ionones, but from the odour standpoint that is where they belong. The important point is that Irones are available from at least four manufacturers, and they all have different odours, since all contain different proportions of isomers. Here again the perfumer must make a choice.

Allyl Ionone

Though not a very new material this has taken sometime to find its proper place. The odour is difficult to describe, but is worthy of very careful examination.

Ambergris

So much work has been done on Ambergris that there are now available a variety of chemicals and bases capable of imparting a true Ambergris character. The following come to mind-

Fixteur 404
Ambropur
Grisambrol

These are agreeable odours which give good results. The one pitfall to avoid is using too much: for they exhibit the characteristic of gaining in relative strength as a composition ages until they may swamp the other elements of the perfume.

Musk

What really surprises me is that the word 'Musk' should be associated with the newer Musk bodies. As the poet put it:

Home is where one starts from
As we grow older the world becomes stranger,
The pattern more complicated.

The Musk deer is on the way out, and now we have:

Musk 781	Cyclolid
Ethylene Brassylate	Phantolid
Cervolide	Exaltolide
Astrotone	Fortolide
Musk BRB	Musk 920
Versolide	There are many others.

These are extremely important odours in their own right and it is difficult to conceive any composition which does not include one of them. They have nothing whatever to do with the odour of natural Musk.

Other Materials

Vertinex

I understand this is cis para tertiary Butyl Cyclohexyl Acetate. This material is difficult to put into any of the catalogues above since it combines a grassy green top odour with a faint Jasmin background reminiscent of Amyl Cinnamic Aldehyde. It is used in very large volume in soaps.

Hydrotropic Aldehyde Ethylen Glycol Acetal

This material recalls the odour of Mushroom to a remarkable extent and has already found important uses.

Jasmonyl—a nonanediol acetate

This possesses a very remarkable Jasmin odour and is modestly priced.

Summary

A number of new materials have been discussed. Clearly the list could be continued indefinitely, but it is hoped that in selecting only those which appear to the writer to be most important this brief article will be of more use than one of greater erudition.

Development of the Grasse aromatic industry

BY JACQUES MAISONDIEU
Antoine Chiris

It is impossible to discuss the development of the essential oil and aromatic industry of the South of France, which is centered in the city of Grasse, without using as a basic example the famous House of Antoine Chiris.

In the year 1768 it was a Mr. Chiris who founded the first industrial enterprise in the South of France for the purpose of extracting essential oil from flowers indigenous to the region. These included Roses, Orange Blossoms, Geranium, Jasmin, Violet and Lavender, to mention only a few. From small beginnings the industrialization of essential oils and, subsequently, simple forms of floral extraction through the now antiquated, but still often used, process of enfleurage (extraction of floral absolutes through the immersion of the blossoms in fat and then in an alcoholic solution), modern industrialization and technical science have evolved far more efficient means of extraction through volatile solvents; and today the big factories in Grasse are operating enormous up-to-date extraction works in which many millions of dollars have been invested.

The development of the essential oil and aromatic raw material business in France over the years has been very closely linked to the development of the manufacturing of perfume and toiletries, as well as cosmetics and soap manufacturing on a world-wide scale. It is difficult to know which came first, the development of aromatics to be used in these finished products or the development of the finished products as the result of constant advances in the science of olfactive products. But, be that as it may, due to an ever-increasing world demand for new odors in new products, as well as old, established items, whether they are for the finest of perfumes selling for $40 or $50 an ounce or whether they are to be used to improve the atmosphere and odor of the home or whether, to cite only several of hundreds of products which today call on the ingenuity and resources of the manufacturers of aromatic products, be they natural or be they of chemical derivation, the Grasse industry has evolved from relatively small beginnings to what it is today, a leader in the creation not only of essential oils and floral absolutes, but also of new fragrances and aromatic chemicals of high quality.

Due to natural economic development, Chiris and other French companies have led in developing sources of supply of raw materials practically throughout the entire world. Plantations for growing essential oils, including Mint in Brazil, as well as many other indigenous products from that region; rose oil and rose absolute from Morocco; orange blossom oil and geranium in Algeria; ylang ylang in the Comoro Islands, to mention only a few, have been acquired and developed with the most scientific agricultural know-how for which the French are famous.

In France itself the plantations of Puberclaire were

acquired by Chiris and have now been developed into a model of agricultural and industrial accomplishment. On these plantations Chiris is producing its famous Puberclaire Lavender and Lavandin, as well as clary sage of high quality, and is experimenting constantly with other floral plants for the purposes of creating essential oils.

Recently all the French companies headquartered in Grasse, have pioneered in developing sources in all areas of the world to produce various type of essential oils indigenous of those regions. As in all its other developments, the many years of French experience handed down from father to son is giving Trojan service in the developing of these new agricultural ventures. Most recently, Chiris has commenced developing agriculturally and industrially along the Coast of Morocco near Casablanca, and has already produced qualities of Geranium Oil in quantities which are expected to increase considerably over its five-year program of development.

The development policy of most of the Grasse companies, in connection not only with agricultural and distillation operations, but also in the aromatic creative side of the industry, has followed a very unique pattern as compared to the industry's competitors in most other countries. The French policy has been to decentralize and spread its activities on a world-wide basis combining the technical knowledge which it has acquired over nearly 200 years of scientific evolution with the technical development and local tastes and requirements in the principal using countries of the products manufactured. Thus there is a complete interchange of technical information constantly flowing from Grasse to the various companies associated in the group, and from those various countries into Grasse in return.

This has placed the entire group of Grasse companies in a rather unique and highly advantageous position through their ability to blend, so to speak, the tastes and requirements of all of the principal countries in the world into an ensemble of modern perfumery raw materials. Whereas it is clear that the Grasse industry, which in its inception was entirely predicated on the extraction in its simplest form of essence from flowers, has in the past 200 years developed into a highly scientific production industry using the most up-to-date extraction methods on the one hand and the most modern industrial and scientific methods for the manufacture of synthetic aromatic chemicals on the other hand; and, in addition to this, has to an ever-increasing degree developed its agricultural methods of plant growing to a point where in the year 1959, for example, there were practically 1,000 tons of Lavandin Oil distilled in the region, whereas only several years before the Second World War Lavandin was practically unknown as a separate entity at all.

Whilst continuing its rapid growth in the South of France region, the French industry is rapidly expanding its activities from every point of view on a world-wide basis in order to increase production of those aromatic products for which the world-wide demand is increasing at an enormous rate due to the higher standards of living of populations whose taste for pleasant odors is ever widening.

SPEAKING FROM FRANCE

A. E. DESPERROIS *has an M.A. degree in Sciences and is a Chemical Engineer E.N.S.C.P. (Escole Nationale Superieure de Chimie de PARIS). He has managed the technical services of Jean d'ALBRET-ORLANE Company of Paris, producers of perfumes and beauty products, since it was founded. Previously he was a Consulting Engineer in perfumes and toilet goods.*

Glycerine
IN MAKE-UP PRODUCTS

Since SCHEELE, 180 years ago, made his famous communication to the Pharmaceutical Society of Upsala regarding his discovery in the residue from pharmaceutical plaster manufacturing of a sugary liquid, the many uses of glycerine (as it was named by Chevreul) have multiplied and even the later discovery of glycols and of other polyols has not slowed down its progress.

Some of those uses have had tremendous repercussions, if only in dynamite, but we shall only deal here with the more peaceful uses. Glycerine is used in the cosmetic industry in a great number of preparations, because its desirable properties cannot all be replaced by any other product comparable with glycerine.

1—Its hygroscopic power is superior to that of all the other polyalcohols. A 57.6% solution of glycerine has a composition which is invariable in normal atmospheric conditions. The presence of glycerine, even in small proportion (between 2 and 5%) gives the water content of a cream a permanent quality which is extremely valuable. These days when hydrating, or moisturizing products are so much in demand, the presence of glycerine remarkably increases the hydrating power of a preparation.

2—Glycerine has a dissolving and plasticizing power superior to that of water. This property is particularly interesting, since a great number of products are used nowadays in the foundation of modern creams and it is necessary to present the public with perfectly homogeneous products. The presence of glycerine in a make-up cream enables the pigments to spread out far more uniformly, thus giving a cream which can be used more easily on the skin.

3—It is particularly rare to discover a skin, even among the most sensitive and delicate, which will not tolerate glycerine solutions. It is on the contrary a very softening product. Furthermore, it has advantage over certain glycols in that it is not toxic.

4—Glycerine does not change with the contact of air in normal temperature conditions. Thus it is not to be

feared that unusual colors will appear nor that odors will eventually develop due to glycerine when products are kept for a long time. This stability is extremely important particularly in liquid make-ups where color variations can take place during the life of the products.

5–Glycerine is chemically compatible. If coloring materials and pigments have pH which is very different from the neutral 7, they still may be acceptable in a glycerine formulation.

6–Glycerine also possesses a fixing power for the perfumes; one knows how difficult it can be to maintain permanently the same perfume note to accompany a make-up product because of evaporation or internal reactions. The presence of glycerine in a make-up insures conservation of the perfume note chosen until the product has been used up.

In all the make-up products, whether they be creams, bases, cream rouge, lipstick, the product which is spread on the skin must not penetrate too deeply. Whereas, in a treatment cream one looks for a very powerful penetration quality for the base, which will support the active product. On the contrary, make-up products should not penetrate the skin. The problem is thus entirely different regarding the use of glycerine in make-up. At the level at which glycerine is used in make-up products its penetration is sufficiently low to avoid undesirable effects.

For still more complete reduction of penetration where it is not desired, it is frequently the practice to use starch glycerol which possesses all the softening and hygroscopic qualities of glycerine. Starch glycerol or glycerite of starch as it is also known, is composed of the following ingredients:

Starch	10 grams
Distilled water	20 cc
Glycerine	70 cc
Preservative	

When a smooth paste of starch, water and glycerine is made, the mixture is heated to around 140°C under constant stirring until the jelly becomes translucent.

LIP JELLIES

Poucher has suggested a number of formulas for lip jellies based on a glycerol-gelatin composition (1). As a basic recipe the following is used:

Glycerine	750
Gelatin	20
40% Formaldehyde	10
Distilled water	220
Total	1000

This formula may be modified by adding either a solution of eosine or of an ammoniacal solution of carmine. Although rose is a popular fragrance, others may be used.

Cerebelaud, the celebrated French perfumer and cosmetic chemist approached the same product slightly differently (2).

Edible gelatin	20 grams
50% Glycerine in rose water	1000 grams

Although varying in approach, the end product contains 2% gelatine in a 50% (approx.) glycerine solution in an already perfumed vehicle, rose water. This jelly may be tinted to suit.

A liquid lipstick formulated along modern lines is attributed to deNavarre.

Polyvinyl alcohol	4 parts
Glycerine	2 parts
Soluble color	1 part
Alcohol	10 parts
Water	83 parts
Total	100 parts

Here the glycerine acts as a plasticizer for the polyvinyl alcohol and prevents drying of the lips.

A liquid rouge in former times was a simple solution of carmine in enough glycerine and water to give the product penetration, lubrication during the application and a moist "dewey" appearance that was considered natural.

However liquid rouges of today are exemplified by the formula given by Heinrich (3).

Color	6.0%
Glycerine	4.0%
Methyl Paraben	0.1%
Diethylene glycol stearate	9.0%
Spermaceti	3.0%
Sodium lauryl sulfate	1.0%
Water	76.9%
Perfume	q.s.

This is a creamy liquid emulsion which may contain both soluble coloring as well as color lakes.

A solid cream rouge currently popular is based on vanishing cream utilizing the plasticizing properties of glycerine. It consists of the following materials (3):

Stearic acid	20.0 parts
Cetyl alcohol	2.0 parts
Glycerine	10.0 parts
Potassium hydroxide	1.0 parts
Water	58.9 parts
Pigment	8.0 parts
Methyl Paraben	0.1 parts
Perfume	q.s.

A more recent version of emulsified lipstick is the following formula devised by Velon (4).

Triethanolamine	6.5 parts
Glycerine	21.5 parts
Eosine solution	3.0 parts
Stearic acid	15.0 parts
Mineral oil	22.0 parts
Ozokerite	26.0 parts
Oleic acid	8.5 parts

This type of lipstick was exceedingly popular some thirty or so years ago in a somewhat different formulation. The above formula may be modified by color lakes to make more acceptable lipstick shades in these modern times. Moisturizing is "built" into the lipstick while emulsification is obtained with currently available materials.

Liquid powders of former times often contained from 10–15% glycerine along with the usual pigments such as talc, zinc oxide, precipitated chalk and suitable colorants of the earth pigment class.

A transitional product between the older liquid powders and the modern liquid make-up is exemplified by two formulas, both patented some time ago. In the older formula, use is made of undecylic (5) acid to give a better wetting to the pigments and longer lasting properties on the skin.

Zinc stearate	3.8 parts
Undecylic acid	0.2 parts
Titanium dioxide	8.0 parts
Talc	10.5 parts
Glycerine	6.0 parts
Water	80.0 parts

The latter formula patented during the last war does not utilize glycerine directly but it does use glycerol tristearate to reduce the surface tension of the oil vehicle (6).

Sesame oil	64.0 parts
Zinc oxide	11.0 parts
Titanium dioxide	16.0 parts
Oxycholesterol	2.0 parts
Glycerol Tristearate	1.0 part
Color	5.5 parts
Perfume	0.5 parts
p-Hydroxbenzoic acid	q.s.

For the past few years, semi-liquid make-up bases containing bentonite have been successfully used. They have a great advantage: They dry fairly quickly on the skin thus giving it a powdery aspect which is very attractive, but they still have one problem: as they dry they have a tendency to tighten the skin thus creating a sort of mask. This is where the use of glycerine is particularly appreciated. The drying process is slowed down according to the quantity of glycerine used. The astringent action is overcome by the softness and hygroscopic quality of glycerine, and as a result one can create a make-up base which will correspond exactly to what one has in mind.

Here are a few formulas for make-up products in which glycerine appears:

1—Triethanolamine stearate	25
Water	35
Glycerine	20
Titanium dioxide	5
Pigment	15
Preservative and perfume	q.s.
2—Talc	40
Starch glycerol	10
Sorbitol laurate	10
Zinc oxide	20
Sorbitol syrup	3
Mineral oil 65/75	1
Water	16
Color, perfume and preservative	q.s.
3—Bentonite U.S.P.	2.5
Titanium dioxide	2
Water	40
Glycerine	25
Propylene glycol	6
Carbitol	6
Triethanolamine stearate	3.5
Mineral oil 65/75	5
Color	10
Preservative and perfume	q.s.

A blemish covering preparation, the patent for which is outdated (7), consists of

2041 grams zinc oxide
720 cc distilled water
300 cc glycerine

This thick paste was then suitably colored. However, glyceryl monostearate 40%, triethanolamine stearate 40%, beeswax 10% and carnauba wax is a good starting point in formulating cake mascara.

To sum up, while glycerine is useful in formulating cosmetic creams it is important in compounding make-up products as well. It possesses plasticizing, moisturizing, spreading and fixative powers so necessary in make-up. Its lubricating and coupling action are not to be dismissed either. When used in sufficient concentration it is a preservative. One must not dispose of starch glycerol and glycerol gelatin too quickly as valuable glycerine modifications for use in make-up and other cosmetics.

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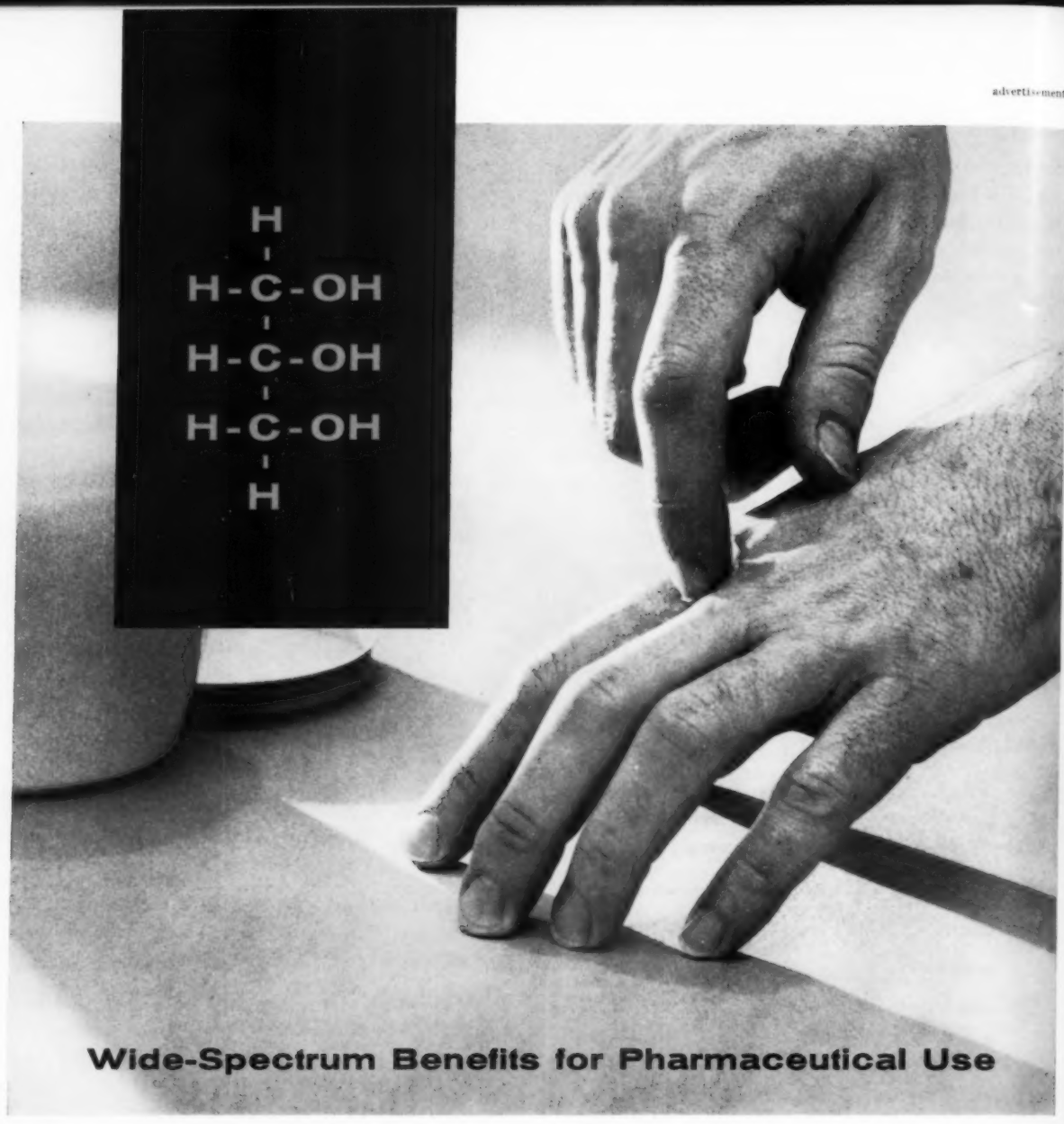

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PACKAGING & PROMOTION

1

1—Max Factor

Max Factor is launching two new lipstick colors for summer at the end of June. These "Cool Coffee Colors" are Cafe Frappe and Coffee Toffee and are designed to accent the full range of brown, beige, muted, whitened and warm fabric tones which are so important in the new season's fashion scene. Cafe Frappe is a coffee-creamed mocha pink and Coffee Toffee is a tawny orange tone. The new shades will be offered initially as Hi-Society refills, Hi-Fi lipstick refills and in regular Hi-Fi lipstick cases. Max Factor expects the new items to be available by June 26th at department stores in a special lipstick tester display.

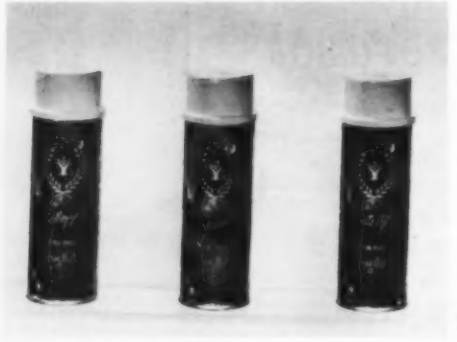
2

2—Shulton

Shulton has introduced a new summertime fragrance line called Sparkling Cologne in all of Shulton's fragrances. Individual color of the product itself gives special eye-appeal to each fragrance, sparkling through a new, very modern, crystal-cut bottle. A display holds four of the new colognes with a special four ounce all-summer size of dusting powder.

3—Lenel

Lenel has introduced a new body dusting powder in three fragrances. Called Bellezza, Caressant and Private Affair these new products are being filled in beautifully designed aerosol containers.



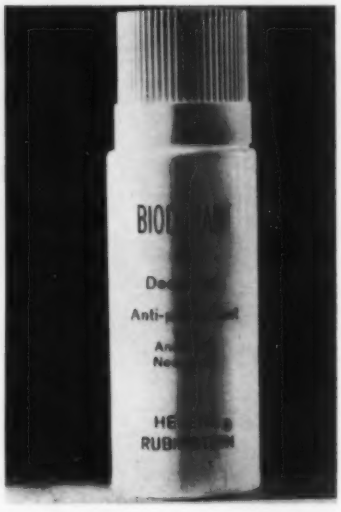
3

4 Jean Nate

Jean Nate is packaging "Friction pour le Bain" in a new 32 oz. frosted bottle. Taller and more slender than the previous clear bottle this design has square shoulders giving the effect of a graceful column. The same distinctive black wooden knob and black satin bow around the neck are being continued.

4

5



6

5—Bourjois

Bourjois, Inc. has incorporated a new hair preparation into the "Evening in Paris" line. While it is an aerosol perfume spray and therefore affords the user the "Evening in Paris" scent it can also be used for hair control. Pale blue, white and the "Evening in Paris" blue provide the color motif for the five-ounce container.

6—Helena Rubinstein

Helena Rubenstein has introduced a new anti-perspirant and deodorant including neomycin. Called Biodorant the new product is being marketed in a zepher-weight, white plastic bottle with gold and turquoise lettering and a roll-on applicator.

7

7—Pierre Balmain

Pierre Balmain has recently introduced a new spray mist fragrance in the United States. Available in either Jolie Madame or Vent Vert fragrance the glass aerosol container is of a unique design.

8—Bourjois

Bourjois has introduced a new concept in fragrance application: the "Applique Sachet." A dispenser making its initial appearance in the fragrance field exudes the contents through a plastic rimmed covering of nylon satin which has been dyed to match the established shades of the scents. Foil labels are wrapped around the bottles which are capped with a plastic, ridged cover. The "Applique Sachet" is available in the three fragrances in Bourjois' summer line: "On the Wind", "Spice 'N Ice", and "Frosty Mist".

8

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A Modern Approach to the Evaluation of Bergamot Oil

By: F. C. Theile, D. E. Dean and R. Suffis
Shulton, Inc.

Bergamot oil is one of the major constituents of many of our fragrances at Shulton. Since it is a highly competitive article of commerce we have concentrated on finding methods which will give us a reliable and rapid yardstick by which to judge this important commodity.

A comprehensive study of several dozen samples of bergamot oil from various sources has been made in our laboratories. Some of the samples which we have examined bordered on, or fell outside the N. F. requirements (1) but we have also encountered oils which met N. F. Specifications, that varied widely in price, odor, color, etc. This aroused our curiosity as to the possibility that they were other than natural bergamot.

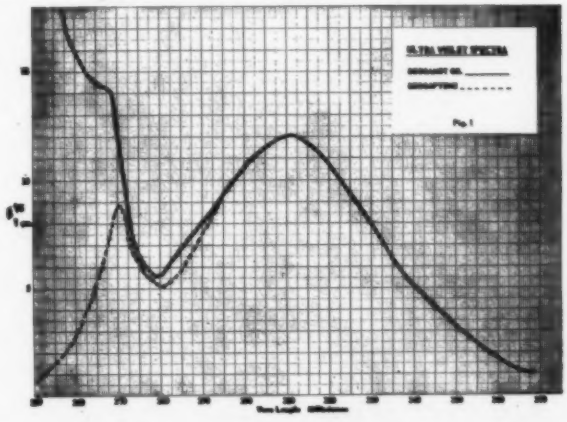
Formerly it was not a difficult matter to ascertain the purity of bergamot oil since any additions greatly altered the physical constants. Today, due to the great variety of natural isolates, terpenes and synthetic aromatics available, it is relatively simple to prepare additives which can not be detected in a routine analysis.

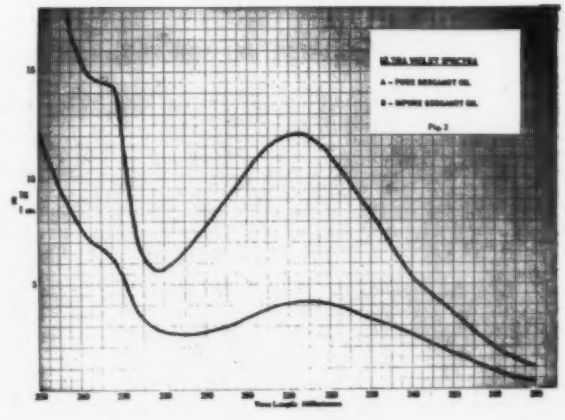
The National Formulary Specifications, with which you are all familiar, include testing for simple chemical and physical properties. To these tests we have added the techniques of ultra violet and infra red spectroscopy and vapor phase chromatography for the detection of possible adulteration.

Spectrophotometric studies in connection with bergamot oil have been reported in the literature (2, 3). We are not advocating new methods of analysis for this material but we have integrated spectrophotometric and chromatographic data with the N. F. tests in an effort to obtain a truer evaluation of quality.

Of course, the final determination as to the quality of bergamot oil as well as all other fragrant materials is left to the trained nose of a perfumer. His olfactory opinion together with the above mentioned analyses provide sufficient data which when correlated with price structure provide a sound basis for final judgment of the oil.

According to Guenther (4)—bergamot oil contains principally; 35-45% linalyl acetate; 20-30% linalool; 63-70% combined alcohol and ester; approximately 5% bergaptene; 25-35% alpha-pinene, d-limonene and miscellaneous terpenes.





This paper was presented at the Sixth Annual Symposium of the American Society of Perfumers, April 28th, 1960, New York City.

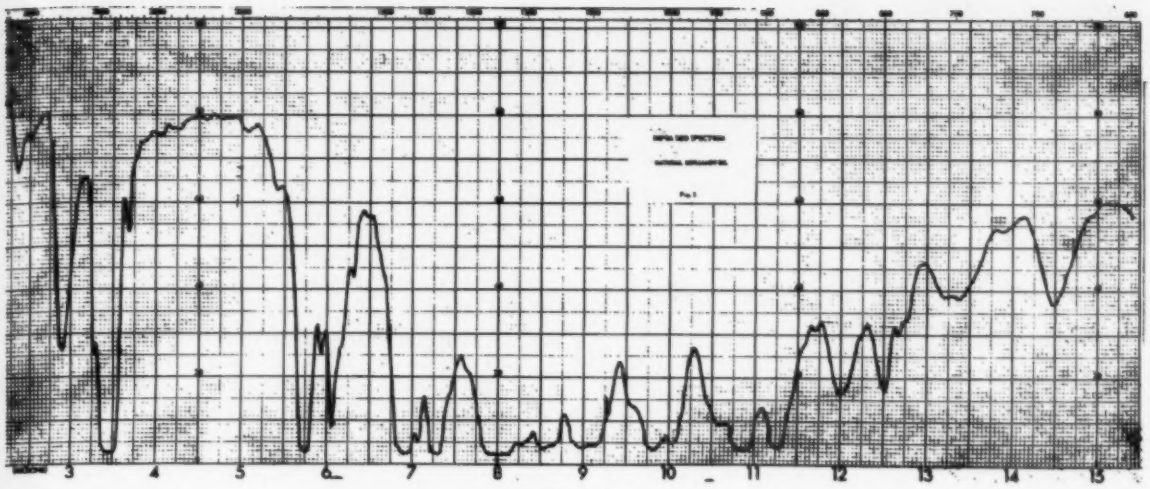


Figure 3

In our investigations we have observed variations of these components which fall into two general types: 1. Addition to natural bergamot of one or more of its components—i.e. linalyl acetate, linalool, limonene or other terpenes whose costs are lower than bergamot itself. 2. Dilution of natural bergamot with synthetic inert substances such as p-cymene, carbitols, high molecular weight esters etc.

We found the ultra violet spectrum extremely valuable in recognizing natural bergamot oil. Bergaptene, a coumarin derivative which accounts for the bulk of the residue on evaporation of bergamot oil, has absorption maxima at 270 μ (2700 Angstroms) and 312.5 μ with a minimum at 281 μ. (Figure 1—bergaptene and bergamot oil—note: for comparison the bergaptene is shown in the same concentration as it appears on bergamot oil.) Although the peak at 270 μ is almost completely obscured by the end absorption of linalyl acetate, the 312.5 μ peak is well defined. Specific extinction coefficients, that is the absorption of a 1% solution in a 1 cm absorption cell at this wave length, vary from 10-13 for natural bergamot.

Diluted bergamots have lower extinction values depending on the extent of dilution, as extinction values are directly proportional to concentration. (Figure 2 shows the U. V. spectra of pure bergamot vs. adulterated bergamot). This method allows us to estimate the amount of pure bergamot oil in a sample. The fixed oil or residue on evaporation test in the N. F. is usually a good confirmation of such dilution but a clever sophisticator can build up the residue by adding non-volatile oils or waxes. The U. V. characteristics are not so easily adjusted and therefore offer a simple, rapid quality check.

Infra-red spectra provides a wealth of information. (Figure 3) We have paid particular attention to the absorbance ratio between the bands at 12.00 μ and 12.52 μ. Terpenes of the type $CR^1\ R^2 = CHR^3$ absorb at 12.52 μ while linalyl acetate absorbs at both 12.52

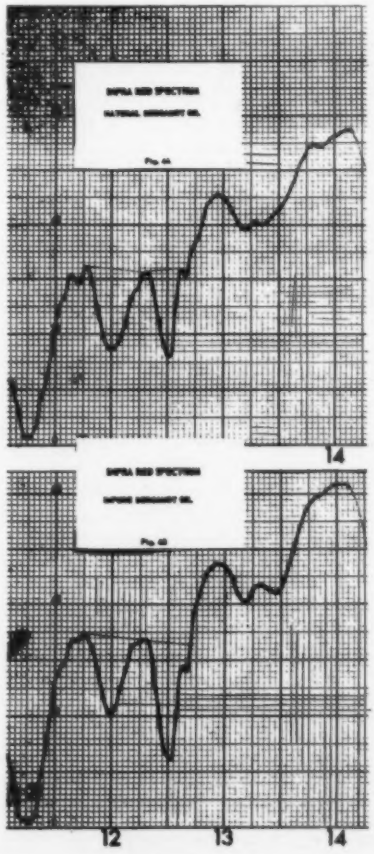
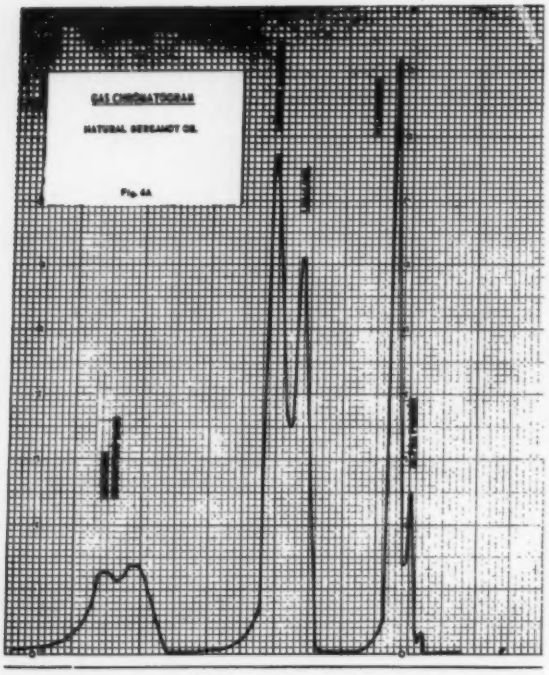


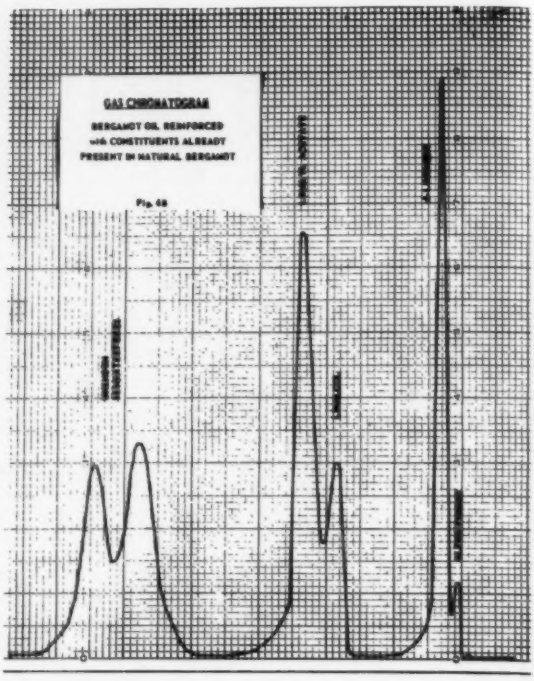
Figure 4

BERGAMOT OIL
VAPOR PHASE CHROMOTOGRAPHY
AREA PERCENTAGES

COMPONENT	RANGE
Alpha Pinene	7—10
d-Limonene	39—46
Linalool	17—24
Linalyl Acetate	22—30

Figure 5





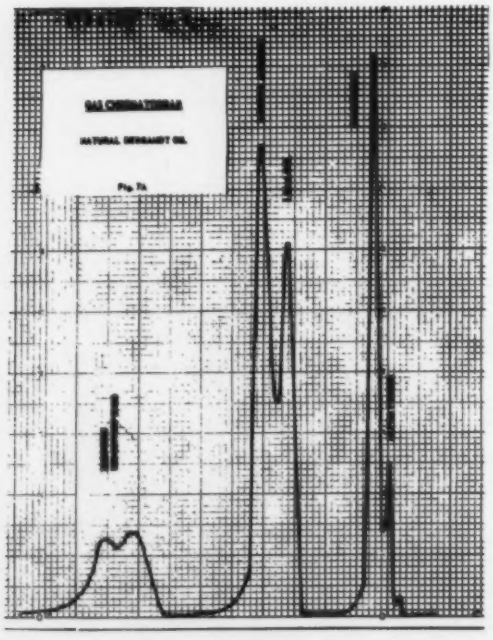
μ and 12.00 μ. Thus if the 12.52 μ absorbance increases without a proportional increase in the 12.00 μ band, we suspect adulteration with terpenes. Incidentally, terpenes are considered excellent additives since they are cheap, plentiful and help keep the oil within the N. F. requirements for optical rotation.

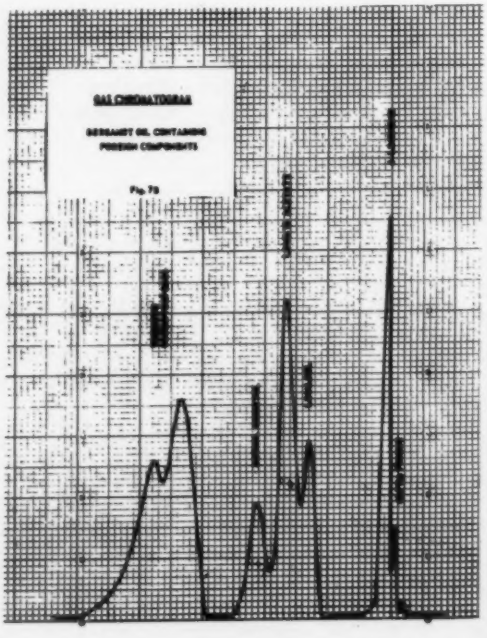
Our study indicated that a normal 12.00 μ to 12.52 μ ratio for natural bergamot oil falls between 0.9 and 1.14. Ratios significantly below the 0.9 figure indicate possible contamination with terpenes. (Figure 4) In all cases where low ratios were found, vapor phase chromatography confirmed an abnormally high terpene content.

The separation of all or most of the volatiles in the oil by gas chromatography offers the additional advantage of identification of extraneous materials.

The chromatograms were run using a Perkin-Elmer Model 154 vapor fractometer with a 12 foot carbowax 1540 Column at 175° C and 25 p.s.i. gauge helium pressure.

Actual amounts of the components in the various samples were not calculated but rather we used the





simple "percentage area measurement" method. Area percentages are not absolute composition values but they do allow direct comparisons between materials. We found that the main natural components present in pure bergamot oil fall within the following ranges. (Figure 5) We are not concerned with the minor constituents which are present in trace amounts.

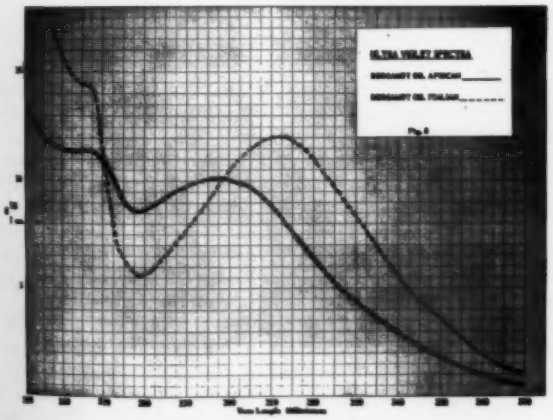
The alpha-pinene and d-limonene ratios are more critical since adulterated oils frequently fall with the limits for linalool and linalyl acetate.

By observing the changes in the relative pinene-limonene values we have detected the addition of lemon oil terpenes together with linalool and linalyl acetate from other sources. The alpha-pinene values are lowered or the limonene values increased. (Figure 6) Incidentally this type of dilution usually does not alter the infra-red absorption ratio limits stated before. If the linalool is omitted this is of course immediately apparent on the chromatogram.

When materials not naturally present in bergamot oil are added they appear as new peaks on the chromatogram as shown in Figure 7. Normally it is not necessary to identify such ingredients as their appearance is sufficient evidence of adulteration. However, we have identified through infra-red and vapor phase chromatographic techniques such containments as methyl carbitol and p-cymene.

Recently samples of African bergamot oil have been received and it is very easy to differentiate between these and the Italian material. The U. V. absorption maximum occurs at approximately 298 μ instead of approximately 313 μ. (Figure 8) Aside from this shift we have found little difference in the other analytical specifications.

We have selected two examples to illustrate the value of our analytical scheme. As shown in Figure 9 they both were acceptable according to N. F. specifications although Sample "Y" had a slightly lower fixed oil content than we normally expect. We then put these samples through our additional testing program. The results are shown in Figure 10. The low U. V. extinction values correspond to about 50% natural bergamot. The low alpha-pinene value for Sample "X" compared to normal values for limonene, linalool and linalyl acetate indicate that this oil was sophisticated with a carefully selected blend of lemon oil terpenes (mainly limonene), linalool and linalyl



BERGAMOT OIL – N.F. ANALYSIS

COMPARISON OF SAMPLES X and Y

ITEM	SAMPLE X	SAMPLE Y	SPECIFICATION
Refractive Index @ 20° C.	1.4668	1.4673	1.4650 – 1.4675
Optical Rotation	+19°	+20°	+8° to +24°
Fixed Oil	5.28%	3.13%	Less than 6%
Linalyl Acetate	38.6%	39.1%	More than 36%

Figure 9

BERGAMOT OIL – ADDITIONAL INSTRUMENTAL ANALYSIS

COMPARISON OF SAMPLES X AND Y

Test	Sample X	Sample Y	Expected Range
$E^{1\%}_{1\ CU}$ 312.5 mμ	6.13	5.65	10 – 13
I.R. Ratio $\frac{12.09\ \mu}{12.52\ \mu}$	1.01	0.74	0.9 – 1.14

VAPOR PHASE CHROMOTOGRAPHY AREA PERCENTAGES

Alpha Pinene	2.1	5.7	7–10
d-Limonene	40.4	37.6	38–46
Linalool	24.1	10.1	17–24
Linalyl Acetate	27.3	25.2	22–32
Unknown Alcoholic Contaminant	—	9.9	None

Figure 10

acetate. Note that in this sample, the infra-red spectrum did not provide us with sufficient data to detect this type of adulteration.

The I. R. data indicated that Sample "Y" was modified by the addition of terpenes. Probably some linalyl acetate was also added to maintain the ester content as per N. F. requirements.

Gas chromatography confirmed this assumption as shown by the lowered alpha-pinene and linalool figures.

In addition an alcoholic contaminant was present in appreciable amount. This was later identified as methyl carbitol.

Conclusions:

The correlation and interpretation of analytical data obtained by the use of modern instrumental methods as presented here provides an accurate and rapid means for detecting additions to natural bergamot oil. It provides the perfumer and purchasing agent with additional information to help judge the qualities of various priced oils. It eliminates to a great degree tedious and complicated wet chemical methods of analysis.

We hope that the use of the correlations shown here will be of value to everyone concerned—the importers, sellers, perfumers and consumers to maintain uniformity of their supplies and obtain the best quality oil at a fair price.

References:

(1) National Formulary, 10th Ed.
(2) Maurel, A. and Bassiere M.,—Annal. Fals. et Fraudes 44, 22-8 (1951)
(3) Preswell, A. K., J. Soc. of Cos. Chem. IV (2) 101, 1953
(4) Guenther, E., The Essential Oils, Vol. III, D. Van Nostrand Company, Inc. 1949, p. 268-271

. . NEWS AND EVENTS . . . NEWS AND

Fifth edition of Chemical Statistics Handbook available

The Manufacturing Chemists' Association has published a fifth edition of the Chemical Statistics Handbook, a 521-page reference book of the chemicals and allied products industry for the years 1954-1958. The publication fills the need for a single volume which includes all available chemical industry statistics from official sources.

Sections in this handbook cover basic inorganics, tars, synthetic organics, coal-tar dyes, synthetic resins, synthetic rubber, industrial alcohol, fats and oils, naval stores, agricultural chemicals, metals, minerals and miscellaneous items.

Other sections cover employment and wages, wholesale prices, import-export figures and corporate data. A section is devoted to Canadian chemical and mineral statistics.

Annual supplements to the new handbook will be published beginning early next year, the first of which will contain 1959-60 statistics on selected items, including final chemical data from the 1958 Census of Manufacturers.

Copies of the handbook are available from the Manufacturing Chemists' Association, 1825 Connecticut Ave., N.W., Washington 9, D. C. at $3.00 each.

Use of bottles for drugs and cosmetics up 4.4% in 1959

Domestic shipments of bottles for packaging drugs and cosmetics during 1959 were up 4.4% over the 1958 total. Of the total 34,998,000 gross, medicine bottles accounted for 21,530,000 and cosmetic containers accounted for 13,468,000 gross. Combined totals for drug and cosmetic use accounted for 23.3% of all domestic shipments of glass containers.

British SCC hears lecture on "Planning a cosmetics laboratory"

Dr. R. H. Marriott, director of research at County Laboratories Ltd., spoke to the Society of Cosmetic Chemists of Great Britain recently on the new Research Laboratories at his company. The laboratories were designed specifically for use in the cosmetic industry and the functional design gives an elegant appearance while making maximum use of space available. In an area of 9000 square feet 60 research workers can be accommodated. In order to obtain space the main formulation laboratory is an open one including the main corridor which was 230 ft. long and 6 ft. wide. On one side shelving with sliding doors has been fitted to give adequate storage for apparatus and chemicals.

Research works have free access, as far as possible, to an adequate-sized library, a Physical Chemistry Department which contains Vapour Phase Chromatography apparatus, a fadeometer of special design using the Xenon Arc for assessing deterioration in sunshine, an optical dark room containing the usual optical apparatus, Unicam Spectrograph, polarimeters, etc. There is a Packaging Department where all packaging materials are examined for their suitability with the various products. Storage tests can be carried out at 1°, 20°, 30° and 40°C. in the four constant temperature rooms. A Physiological Section includes Histology and Bacteriology and is used for fundamental investigations essential in research dealing with cosmetic products. A Biochemical Department contains facilities for carrying out radio-isotope experiments.

New laboratory at Phila. College of Pharmacy

The C. Mahlon Kline Pharmacology Laboratory at the Philadelphia College of Pharmacy and Science was dedicated on May 10th. Construction of this addition has been completed and full equipment for undergraduate laboratory instruction in pharmacology has been installed. It is named in honor of Dr. C. Mahlon Kline, honorary chairman of the board of Smith, Kline & French Laboratories and vice-president of the College.

Mennen announces expansion of product lines

The Mennen Company has established five distinct product lines–Mennen's Men's Line, Baby Magic Products, Date-Line Products, Family Products and Proprietaries. The Company has also announced plans to introduce a new line of men's toiletries, Citation, on a regional basis.

Squeezable metal tube sales up 7% for first quarter

The Collapsible Tube Manufacturers Council reports that shipments of squeezable containers totalled 300,796,704 units in the first quarter of this year, up 7% over the corresponding period of 1959. A sharp gain came in tubes for packaging medical and pharmaceutical preparations, an increase of 15%. Next were cosmetic tubes with 27,698,544, or an increase of 8%.

New U.S. agents for Mero & Boyveau

Biofen Laboratories, Bridgeport, Connecticut have been appointed agents in this country for Mero & Boyveau of Grasse.

Survey shows lotion preferred by women for hand care

Lotion is preferred by most women for hand care is the finding of a survey of homemakers made by the Home Makers Guild of America for the Toiletry and Cosmetics Division of Owens-Illinois Glass Company. The statistics show that twice as many women prefer lotion over cream for care of their hands. Almost nine out of ten homemakers (87.6%) actually use lotion while users of cream totaled slightly more than seven out of ten (71.9). The report shows that fifty-five percent use both lotion and cream.

Copies of the survey can be obtained by writing the Toiletry and Cosmetics Division of Owens-Illinois, Toledo 1, Ohio.

Featured speakers and special guests at the luncheon meeting of the Fragrance Foundation held on May 10th at the Hotel Plaza, New York City, are (left to right): Mlle. Mony Dalmes, former star of the Comedie Francaise, Mr. Adam Gimbel, president of Saks Fifth Avenue, Miss Ilka Chase, noted actress and author, Mr. Joseph Danilek, president of Mary Chess & Schiaparelli, (chairman of the executive committee of the Fragrance Foundation), and the incomparable Hildegarde.

Allied Chemical expands research facilities

Allied Chemical has announced a major research expansion which will more than double the laboratory facilities of its General Chemical Division near Morristown, New Jersey. With this additional space almost 500 research scientists and supporting staffs will eventually be accommodated.

Rexall subsidiary acquires Darwin Laboratories

Riker Laboratories, ethical drug subsidiary of Rexall Drug and Chemical Company, has announced the acquisition of Darwin Laboratories and four associated companies. George L. Maison, president of Riker, has announced that Nathan A. Wolfstein Sr. and Nathan A. Wolfstein Jr., who founded Darwin Laboratories, Harvard Laboratories, Glanco Sales Company and Southern California Gland Company, will continue to be active in the management of these companies.

New England SCC hears speakers from Conn. School of Pharmacy

Members of the New England Chapter of the Society of Cosmetic Chemists heard a discussion on "Applications of Ultrasonic Energy to Dispersion Systems" presented by Professor Donald M. Skauen and Assistant Professor Harold M. Beal from the Connecticut School of Pharmacy at their meeting on April 28th.

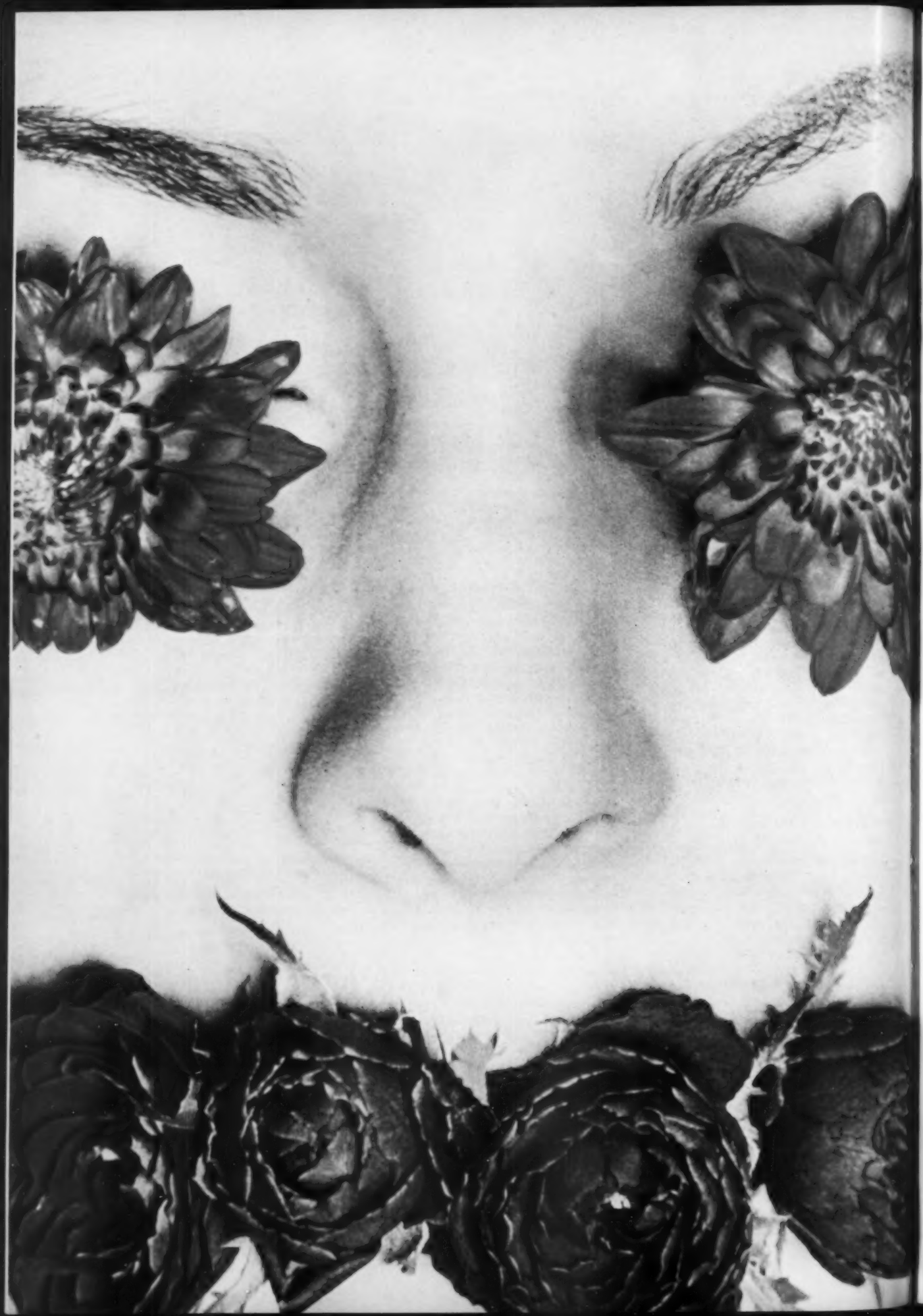
At the business meeting new by-laws were submitted, voted upon and adopted. This was the third meeting of this newly-formed Chapter.

Travelers

George V. Branigan, vice president of Ungerer & Company, has returned from a trip around the world. Enroute he visited customers and suppliers of raw materials marketed and processed by the company in New Zealand, Australia, South Africa, Kenya Colony, Egypt, Italy and Spain.

Mr. M. T. Bielser, production manager of Cia. Brasileira Givaudan, Sao Paulo, Brazil, recently completed a visit with The Givaudan Corporation in the United States. The major objective of his visit was to establish personal contact with plant management and the research and development departments here.

Mr. Javier Serra, founder and international president of Dana, spent the month of May in New York conferring with Dana executives. Since the beginning of the year, Mr. Serra's travels have taken him to France, Argentina, Uruguay, Brazil and Venezuela, five of the thirty-two countries in which Dana manufacturing plants are situated.



What is the fragrance impulse?

Neither do the eyes see it nor the mouth detect it. Seek to capture it, it may elude you. It has no feel, yet is felt powerfully. But find a product with fragrance that sells well, and you can be sure it is there . . . the fragrance impulse.—For the fragrance impulse moves people. It is the art of persuasion through fragrance . . . a highly developed art at Givaudan.—To create the fragrance impulse is perhaps the most challenging test of the master perfumer. It requires near-genius to develop and rare understanding to apply. So if you are planning a new product, come to Givaudan. We can create for you the special fragrance that will sell best in today's changing market. No one in the world has done so much to help sell so many products with fragrance. Givaudan-Delawanna, Inc., 321 West 44th Street, New York 36, New York

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MASTERS OF THE FRAGRANCE IMPULSE

Dr. Aaron B. Lerner (Right), Professor of the Yale University School of Medicine is presented the Annual Special Award of the Society of Cosmetic Chemists at the semi-annual scientific meeting of the Society held on May 12 at the Hotel Biltmore, New York. Mr. H. J. Amsterdam, president of the Society, presents the award in recognition of Dr. Lerner's work on enzymes and hormones which control skin pigmentation.

Record attendance at N.Y. SCC ladies night

The annual ladies night of the New York Chapter of the Society of Cosmetic Chemists brought out a record 260 people to the Diamond Horseshoe in New York City on April 22nd. The highlight of the evening was the presentation of a chest of fine soaps to each lady with the compliments of the Hewitt Soap Company.

Health Information Foundation elects new chairman

George R. Cain, president and general manager of Abbott Laboratories, has been elected chairman of the board of the Health Information Foundation. He succeeds Eugene N. Beesley, president of Eli Lilly and Company, who has served as Foundation board chairman since 1958.

The Foundation is sponsored by firms in the drug, pharmaceutical, chemical and allied industries and conducts research in the social and economic aspects of medical care in the United States.

Dragoco booklet

A beautifully illustrated booklet has been prepared by Dragoco, that presents a typical cross-section of the factory installations. The booklet is written in five languages, and effectively illustrates the advanced stage of technical and scientific processing engaged in at this firm. Copies of this booklet can be had by writing to the firm at Holzminden, West Germany.

Phenol plant for Argentina

A new phenol plant will be built in Argentina by Duranor, recently formed by Atanor, Compania Nacional para la Industria Quimica and Hooker Chemical Corporation. This plant will have a capacity of 25 metric tons of phenol per day, and will be located at Rio Tercero 450 miles northwest of Buenos Aires.

First quarter soap and detergent sales hit new high

Soap and synthetic detergent sales reached a new peak in the first quarter of 1960 according to the quarterly sales census conducted by the Association of American Soap & Glycerine Producers, Inc. In comparison with 1959 sales were up 10.9% in volume (totalling 1,081,873,000 pounds) and 10.6% in value (totalling $273,873,000). The totals are the highest first quarter figures on Association records.

Synthetic detergent sales totalled 825,851,000 pounds (12.7% up from 1959) and $201,029,000 (up 12.2% from 1959). Solid synthetic detergents increased by 7.4% in quantity and 8.0% in value from the first quarter of 1959 and liquid synthetic detergents were up 41.3% in pounds and 25.2% in value from the first three months of 1959. Synthetic detergents now constitute 76.3% of total reported sales in pounds and 72.9% in value.

Improvement was shown in soap sales which have been decreasing. Sales volume totalled 256,022,000 pounds and dollar sales amounted to $74,844,000. These were increases of 5.6% and 6.5% respectively.

Not included in the soap and detergent figures above are scouring cleanser sales totalling 96,638,000 pounds and $12,774,000 compared to first quarter 1959 figures of 100,880,000 pound and $14,167,000.

SCC Conferees: E. A. Bush and William G. Foley of Dragoco, Inc.

All-round soap powder bows at Super Market Institute

Calgon Company, division of Hagan Chemicals and Controls, Inc., introduced Calgon Bouquet, a scented powder recommended for bathing, shampooing, shaving and washbowl laundering, at the annual Super Market Institute convention in Atlantic City early this month. The product, which was test marketed in Spokane and Denver, is a companion product to Calgon water conditioner and Calgonite for electric dishwashing.

Brand Names Foundation re-elects Breck

John H. Breck, Jr., executive vice president of John H. Breck, Inc., was re-elected chairman of the board of the Brand Names Foundation at the Foundation's board meeting on May 6th in New York City.

SCC Conferees: Jack Wiedhopf, Chairman of Board of Roure-Dupont, Inc. and Dr. Oliver L. Marton of Shulton, Inc.

Participants at the Technical Meeting of the Toilet Goods Association: Nathan Fretz, Roubechez, Inc. and Roy Hagelin of Ungerer & Co.

Capitol opens new aerosol loading plant

Capitol Packaging Company has opened a new aerosol loading plant in Melrose Park, Illinois to handle the private label trade exclusively. Capitol can load more than 25 million aerosol packages per year in this new plant which is located at 1501 North 31st Street in Melrose Park.

SCC Conferees: V. M. Votaw, Proctor & Gamble and Dr. Eric Hewitt of Evans Research & Development Corp.

PERSONALITIES

Fred N. Dundas was re-elected president of the Glass Container Manufacturers Institute, Inc. at a meeting of the board of trustees held on May 26. Mr. Dundas is president of the Dominion Glass Company Limited, Montreal. C. G. Bensinger of Owens-Illinois Glass Company was elected first vice-president and J. G. Ferguson of Laurens Glass Works, Inc., second vice-president.

Eve Hendrickson

Mrs. Eve Henriksen has been named director of packaging of Dana Perfumes Corp. Her responsibilities will entail new packaging and product development. She will also assist Mr. Richard Livingston, vice president, with merchandising and promotional projects. Mrs. Henriksen was formerly associated with Hudnut-DuBarry in the capacity of packaging coordinator and stylist and recently has been design consultant on a free-lance basis.

Joseph G. Vrindten has been appointed to the research and development department of the Colgate-Palmolive Company's Household Products Division. He was a member of the industrial engineering department staff and also worked in the Jersey City plant control laboratory prior to his appointment to the research and development department.

William A. Hoffman, Jr. has been appointed director of the purchasing department of Hercules Powder Company. Mr. Hoffman succeeds Edwin S. Ladley who retires at the end of June. Assistant director of the purchasing department since October 1954, Mr. Hoffman joined Hercules in 1940.

Joseph Chira has been appointed advertising director of Lanolin Plus, Inc. Mr. Chira was formerly associated with Kenyon and Eckhardt where he served on the Max Factor account. Prior to that he was executive assistant to the senior vice president of marketing for Helena Rubinstein, Inc.

William F. Christopher will fill the newly-created position of director of marketing for Hooker Chemical Corporation. Mr. Christopher comes to Hooker from General Electric Company where he was manager of market development in GE's Chemical materials department, Chemical and Metallurgical Division.

Marvin L. Mann

Marvin L. Mann has been named director of United States advertising for Max Factor & Company. For the past 22 years, Mr. Mann has been associated with Edward H. Weiss and Company, advertising agency, Chicago, as vice president, member of the board of directors and a member of the executive committee.

Karl T. Kraner

Karl T. Kraner is the new marketing manager for Kessler Chemical Company, Inc. Mr. Kraner previously served for twelve years in the sales and marketing departments of Atlas Powder Company.

Robert M. MacFarlane has been appointed general sales manager of Lanolin Plus, Inc. Mr. MacFarlane was previously assistant general sales manager of Warner-Lambert Pharmaceutical and prior to that he was general sales manager of Anahist Research Laboratories.

Douglas L. Miller has been promoted to district sales manager of the Hudnut-DuBarry Division of Warner-Lambert Pharmaceutical Company covering Texas, Oklahoma, Arkansas, Tennessee, Mississippi and Louisiana.

Dr. Reginald L. Wakeman has been appointed vice president and director of research and development of the Onyx Chemical Corporation. He joined the predecessor Onyx Chemical Corporation, then known as Onyx Oil and Chemical Company, as director of research in 1945. He left in 1951 to become technical director for Quaker Chemical Company. Most recently he was director of new research and development for the Packaging Corporation of America.

Raymond M. Burke has been named supervisor of market research of Heyden Newport Chemical Corporation. Mr. Burke joined Heyden Newport in 1959 and had been associated with U. S. Borax and Chemical Corporation and General Foods Central Research Laboratory prior to this move.

Richard N. Parks

Richard N. Parks has been elected to the board of directors of Shulton, Inc. Mr. Parks has been vice president-sales since May 1958.

George G. Shackleford, Jr., has been appointed wholesale drug manager and product manager for Rybutol by Lanolin Plus, Inc. Mr. Shackleford joins the company after a two-year tenure at Clairol, Inc. where he was assistant to the vice president in charge of sales.

Mimi Weiss

Miss Mimi Weiss has been appointed sales promotion manager of Alexandra de Markoff. Miss Weiss was formerly fashion director of Princess Marcella Borghese and prior to that was associated with *Seventeen* magazine.

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Dr. Irving Reich has been appointed director of proprietary research for Carter Products, Inc. Dr. Reich, formerly chief of the physics and chemistry section of Lever Brothers Research Center, is the developer of "Rise," the first aerosol shaving cream, and the holder of the basic patent in this field. Dr. Reich is also the discoverer of a process for extracting sesamin, an insecticidal synergist, from sesame oil.

Thomas LaPrelle, Sr.

Thomas LaPrelle Sr. has been elected vice president in charge of sales of Kolmar Laboratories, Inc. Mr. LaPrelle has been with Kolmar since 1945 and has been in the industry for the past 40 years.

Robert J. Siebert has been elected vice president of Crown Cork & Seal Company, Inc. Mr. Siebert will direct all of Crown's manufacturing and sales activities in the Western region.

Joseph Schwartz

Joseph Schwartz will fill the position of director of purchasing for Bourjois, Inc. With a twenty year background in the cosmetic industry, Mr. Schwartz was most recently affiliated in the same capacity with Helene Pessl, Inc. which Bourjois acquired in January of this year.

Marvin F. Preiser

Marvin F. Preiser was recently elected assistant vice president in charge of production of Polak's Frutal Works, Inc. For the past fourteen years Mr. Preiser has been associated with the Flavor and Production Departments of P.F.W.

Frederick C. Visor has been named product manager of the pharmaceutical division of Shulton, Inc. Prior to joining Shulton, Mr. Visor was advertising and sales promotion manager of veterinary products for the agricultural and laboratories division of Charles Pfizer & Co., Inc.

Technical digests and abstracts

Constituents of Meat Flavor: Beef.

By Irwin Hornstein, Patrick F. Crowe, and William L. Sulzbacher.

(digested from the JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY January/February, 1960, Volume 8, No. 1, p. 65).

What are the chemical substances responsible for the flavor in beef? This paper by Hornstein, Crowe, and Sulzbacher deals with the methods used to fractionate fresh beef into potentially flavorful and nonflavored portions and with the preliminary chemical investigation of some of the isolated products. A beef powder extract was separated from raw beef, heated under vacuum, and the total volatiles were analyzed for carbonyls. The acidic and basic components were also examined.

Fresh meat was aged for ten days at 36°-38°F. The meat sample was thawed, trimmed, and ground. A slurry was made, contrifuged, and the decanted liquid was filtered. The filtrate was shell-frozen in a dry ice-isopropyl alcohol bath and lyophilized. The powder was introduced into a system of distillation and fractionation. The fractionation train consisted of three fraction collectors. The observations were conducted at a temperature of 100°C. The fractions in each of the traps were analyzed. The carbonyls in the three traps were converted to their respective 2, 4-dinitrophenylhydrazones. The acidic compound in the most volatile fraction were converted to their ammonium salts and the basic compounds were converted to hydrochlorides. The residue in the first trap consisted of a colorless viscous liquid which was water soluble and had a pleasant fruity odor. This material was separated into at least two constituents by paper chromatography, and the identification of the compounds is still under way. The carbonyls were found by the paper chromatographic technique of Gaddis and Ellis, to be acetone acetaldehyde and formaldehyde (less than 0.05 mg 1 gm). The acid volatiles evolved carbon dioxide and hydrogen sulfide. The latter was determined on a 1 ml. aliquot of the total acid fraction. The absorption was measured at 667 mu. The concentration of 0.1 mg of hydrogen sulfide per gram of powder was read from a standard curve of sodium sulfide. The basic volatiles were determined by a chromatographic method and were found to contain small amounts of methylamine hydrochloride and ammonium chloride.

To check results from animal to animal and from muscle to muscle, the infrared spectra of the least volatile constituent were obtained. These spectra were similar in nature and the general odor characteristics were identical. Results indicated that flavor contributors were water soluble. The dried powder of the extract evolved aboiled beef aroma when added to hot water.

Vegetable Estrogens.

By Hans Neuman.

(digested from KOSMETIKERINNEN FACHZEITUNG p. 4. #87, 1959.)

Hormones have been used in cosmetics, generally, to rejuvenate aging skin, but the danger of an overdosage of the hormones of animal origin have always caused concern. The possibility of using plant hormones in cosmetics is of great interest. These 'biological activators' can cause specific effects in animals. Likewise, animal hormones can influence the growth of plants. They are, according to their chemical structure, derivatives of the steroids, flavenols and coumarin. They are generally phenol-like substances with an important OH group that becomes active when the ester is split by means of acidification, fermentation, or saponification. Plant hormones only show activity in animal tests after previous fermentation. Animal estrogens are nearly always in a free state. Plant hormones can be taken orally and are found in practically all plant food consumed by man. The daily requirement is approximately 2000-3000 mice units (10,000 mice units = 1 mg estrone). Their activity is expressed in units based on tests with live animals (Rats and Mice units according to the ALLEN-DOISY METHOD). Cows and pigs showed that temporary sterility resulted after too high a dosage of these plant hormones. It is shown that 1 gm pure estrodial = 27,000,000 mice units; 1 gm pure estrone = 8,000,000 mice units; 1 gm pure estrone = 75,000 mice units. The estrogenic effect of a 1 kg sample of dried plant substances can be shown with this representative group.

Hops	1,000,000	mice	units
Hay	20,000	"	"
Sugar beet leaves	900	"	"
Dandelions	800	"	"
Wheat bran	1,000	"	"
Wheat germ oil	6,000	"	"
Phyto hormone extract from wheat germ	12,000	"	"

Plant estrogens have been used in some cosmetic products with good results. Those plant extracts containing the highest quantities of hormones have brought about better blood circulation and the regeneration of cellular tissue, as well as cell growth. Another advantage in the use of these plant hormones is seen in the fact that plants also contain vitamins. The germ oils of cereals contain high quantities of vitamin E and the highly unsaturated fatty acids of vitamins F. The alcoholic polyvitamin concentrates from wheat germ oil are a combination of biological, fat soluble sugars, lecithin, proteins, trace elements, and estrogens. They are also rich in enzymes that can be preserved by carefully extracting the material. The wheat germ extracts may be processed alone or in combination with placenta and vitamin extracts. They can be added in amount of 5-30% to different cosmetic products depending on their nature and the purpose of the product.

The Synthesis and Antifungal Evaluation of Certain Acetylenic Compounds, James A. Waters and Gail A. Wiese

A number of 4-diethylamino-2-butynyl esters and 1,4-bis-N-substituted amino-2-butynes were prepared. The compounds, in the form of their hydrochloride and/or methiodide salts, were tested in vitro against three fungi causing dermatomycoses. Several compounds exhibited good activity in comparison to the control compound, sodium undecylenate. The most effective compound in this investigation was 4-diethylamino-2-butynyl o-toluate hydrochloride. *Thru J. Am. Pharm. Assoc. Sci. Ed., 49, 2, 112(1960).*

Investigation into the Process of Sterilization. *Relation Between the Temperature of the Sterilized Solution and that of the Sterilizator, Svirkow, A. I., Aptechnoe Delo (S.S.S.R.)* 8, 4:13 *(July-Aug.)* 1959.

The relation between the temperature of the sterilized liquid and that of the sterilizator was studied. In this respect the conditions of work in pharmacies were taken into account. The following factors were involved: (1) chemical composition of the liquid (distilled water, solutions of 0.85% and 10% sodium chloride, 1% and 2% procaine chloride, 5 to 10% calcium chloride, 25% magnesium sulfate, 40% glucose, etc.), (2) volume of the liquid (100 ml., 200 ml., 500 ml., and 1000 ml.), (3) duration of the sterilization (30, 60, and 120 minutes). Among the many results the following are most important: After applying heat to the sterilizator during 3 minutes one obtains the same temperature in the liquids as in the sterilizator within 2 to 3, 4 to 5, 6 to 8, 10 and more minutes after putting 100 ml., 500 ml., and 1000 ml. respectively in the sterilizator. The greatest time differences were ascertained with respect to low concentrations of substances and to distilled water. However, as far as the necessary duration of the sterilization is concerned, the concentration of substances lacked importance. The author suggests prolongation of the usual sterilization times according to a table with two entries, i.e. volume of the liquid and the chemical composition of the dissolved substance. The additional times are 5 to 10 minutes. Hubert Zacek. *Thru AMERICAN JOURNAL OF HOSPITAL PHARMACY, Vol. 1, No. 12, December 1959, p. 729.*

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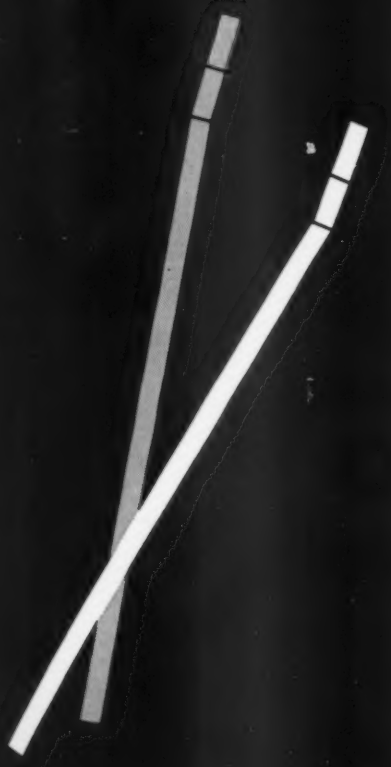

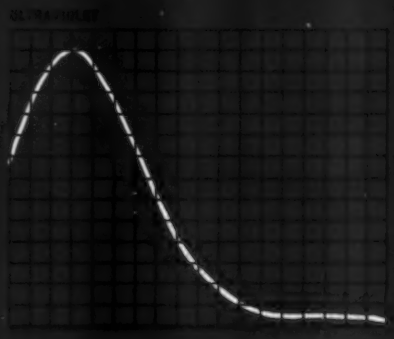

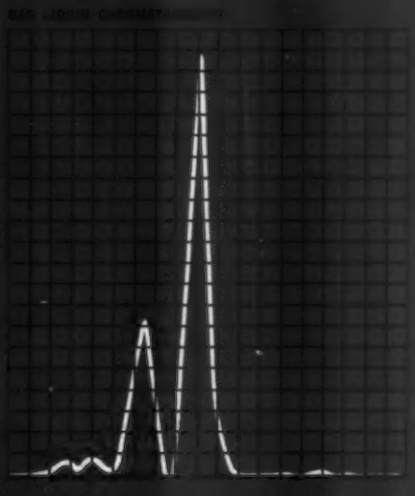

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